United States Court of Appeals

for the

District of Columbia Circuit

TRANSCRIPT OF RECORD

UNITED STATES
COURT OF APPEALS FOR THE
DISTRICT OF COLUMBIA

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BRIEF AND APPENDIX
FOR APPELLANTS

IN THE

United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA

No. 8210

935

THE HYDRAULIC PRESS CORPORATION, INC., AND
WALTER ERNST, *Plaintiffs-Appellants*,

v.

CONWAY P. COE, Commissioner of Patents,
Defendant-Appellee.

Appeal from the District Court of the United States for the District of Columbia.

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Appeal No. 8210

THE HYDRAULIC PRESS CORPORATION, INC., AND
WALTER ERNST, *Plaintiffs-Appellants,*

v.

CONWAY P. COE, Commissioner of Patents,
Defendant-Appellee.

Appeal from the District Court of the United States for the District of Columbia.

BRIEF FOR APPELLANTS.

I. NATURE OF THE ACTION.

This is a suit brought under Section 4915 U. S. R. S., 35 U. S. C. A. 63, by the plaintiffs against the Commissioner of Patents because he refused to issue a patent upon the application of Walter Ernst, S. N. 154,365, including claims 4, 5 and 7.

The Hydraulic Press Corporation, Inc., is the assignee and Walter Ernst is the applicant.

The Commissioner of Patents relies for anticipation upon the patent of Ferris, 1,970,134.

The issue before the court is whether a hydraulic system which discloses that the full flow of hydraulic pressure from a pump is applied **solely** *upon the main ram to develop a "drawing force" and to continuously advance the ram through a pressing stroke, a portion of the "drawing force" being automatically diverted to generate clamping pressure during the continuous forward advancement of the ram in proportion to the total drawing force, resulting in economy of power and increased speed of operation can be anticipated by a hydraulic system such as that disclosed in the Ferris patent 1,970,134, wherein a pump applies hydraulic pressure first to clamping rams and* **secondly** *to a main ram, acting independently of the clamping rams,* **after** *the clamping rams have completed their clamping stroke and through independent fluid lines, in parallel flow relationship.*

II. ERRORS OF LAW.

We come here upon the following questions of law that have been erroneously construed by the lower tribunals.

> 1. A method or a process claim cannot be anticipated and therefore denied by the citation of a patent disclosing a mechanical apparatus unless the method or process is capable of being performed by the apparatus as an inherent feature of its normal operation and without requiring alteration of the apparatus to perform the claimed method or process. (Conclusion of Law 1, Appellants App. 133.)
>
> 2. Commercial success of an apparatus or process covered by the claims in issue, and the immediate acceptance thereof by the purchasing trade resulting in large sales is proof of invention sufficient to swing the scales of doubt in favor of the applicant for a patent

in case there is doubt regarding the question of invention over the prior art. (Appellants App. 133.)

3. Claims containing subject matter not specifically disclosed in the prior art are patentable when the subject matter claimed discloses an improvement over the prior art that has shown to have definite utility and improves the operation of an apparatus constructed in accordance with the subject matter of the claims. (Appellants App. 133; Conclusion of Law 1.)

4. Claims of an application shall be interpreted in the light of the specification of which they are a part and the language of the claims shall not be given a broader interpretation than can be discovered by the language of the specification. (Appellants App. 133; Conclusion of Law 1.)

III. ERRORS OF FACT.

We come here on the following erroneous conceptions of fact:

1. That the hydraulic system of Ferris patent, 1,970,134, discloses a system wherein there is a diversion of the "drawing force" within the meaning of claims 4, 5 and 7, merely because liquid is supplied to the hold-down clamps and the main ram from a single pump. (Finding of Fact 4, Appellants App. 132.)

2. That "fluid pressure" referred to in the Ferris patent is synonymous with, and is the same thing as, the "drawing force" recited in the claims of the Ernst application. (Finding of Fact 4, Appellants App. 132.)

3. That the method of generating and utilizing hydraulic power as disclosed by Ernst in his application is inherent in the normal operation of the Ferris apparatus. (Finding of Fact 6, Appellants App. 133.)

IV. NATURE OF THE INVENTION.

> "2. The Ernst application here involved discloses an hydraulic press for forming sheet metal in which the metal to be shaped is clamped at its periphery while the central portion is forced into a die cavity by means of a plunger. The plunger is actuated by an hydraulically operated piston and the clamping pressure is applied by means of auxiliary pistons which move in cylinders formed in a block at one end of the main piston. The arrangement is such that as the main piston moves the drawing plunger toward the work it also serves to generate hydraulic pressure in the cylinders containing the clamping pistons." (Finding of Fact No. 2)

The problem of the applicant Ernst was to improve the efficiency of a hydraulic press and increase the speed of operation thereof through coordination of the clamping apparatus and the pressing apparatus so that clamping of the work piece and pressing thereof could be accomplished by a continuous forward stroke of the pressing ram, and automatically develop the clamping pressure during the forward stroke of the ram to increase the number of press cycles per minute capable of being performed by the press. The movements of a hydraulic press are inherently slower than the movements of a mechanical press because of the large volumes of liquid required to be pumped to the various actuating mechanisms of the hydraulic press. Therefore it was also a problem to conserve as much power and energy as possible while increasing the rapidity of operation of the press, and to use only that power required for any particular operation, either of the main ram or of the hold-down clamps.

A short description of the Ernst hydraulic press will clarify the exact operation of the press. Referring to Fig. 1 of the drawings of the Ernst application there is provided a pump 30 that delivers liquid to a main ram 22 through either of the conduits 26 and 27 controlled by a conventional four-way valve 28. A platen 36 is carried by the ram 22 having cylinders 37 that receive pistons 38 carried by a hold-down clamp 44. A die 41 is carried by the platen 36 to engage a metal blank 16 to form the same. Check valves 46 permit entry of liquid into the cylinders 37 from the conduit 47 in the ram 22 but prevent escape of liquid from the cylinders. Relief valves 51 are normally closed and do not open until the pressure in the cylinders 37 reach a predetermined value. The relief valves 51 are individually adjustable to individually control the pressure at which liquid is released from the cylinders 37.

The operation of the Ernst hydraulic press is such that the pump 30 delivers liquid to the space 21 above the ram 22 causing the ram to move downwardly. The cylinders 37 in the platen 36 have been filled with liquid through the conduit 47 in the ram 22 during a previous return stroke of the ram. As the ram 22 moves downwardly the hold-down clamp 44 engages the metal blank 16 whereupon the clamp 44 stops movement. The platen 36 continues movement whereby relative movement between the pistons 38 and the cylinders 37 is caused to compress the liquid in the cylinders 37 until a predetermined pressure is reached, at which time the relief valves 51 open to relieve excess pressure from the cylinders 37.

It should be noted that the applicant **Ernst supplies hydraulic liquid under pressure** from the pump 30 **solely to the space 21 above the main ram 22 during the forward stroke of the ram.** The liquid pressure existing in the space 21 acts upon the area of the head of the ram 22 to produce a force capable of being used whenever the ram 22 meets resistance.

The first resistance met by the ram in its forward stroke is the resistance caused by compression of the liquid in the cylinders 37 by the blankholder pistons 38. The total effective force capable of being produced by the ram 22 is available to overcome this resistance, which it does, to generate hydraulic pressure in the cylinders 37 to apply clamping force upon the end of the pistons 38 to clamp the blankholder upon the metal blank 16.

As the main ram continues its forward motion there is then available for use a force for drawing the metal blank that has been lessened by the amount of force required to generate the clamping pressure in the blankholder cylinders 37 so that the drawing force available for forming the metal blank is not the total force capable of being produced by the ram 22.

It may thus be seen that **a portion of the "force" capable of being developed by the press ram has been diverted, or used, to generate the clamping pressure.** As for example, if a fluid pressure of 2000 lbs. is developed by the hydraulic pump for delivery into the chamber above the main ram and if the head area of the main ram is 100 sq. in., the force capable of being developed by the ram 22 will be the "pressure" times the "area" or a "force" of 200,000 lbs. If a fluid pressure of 500 lbs. is to be generated in the clamping cylinders, and the clamping pistons have a total effective area of 20 sq. in. that a "force" of 10,000 lbs. is required to generate the clamping pressure. Therefore this force of 10,000 lbs. is diverted from the total "force" capable of being developed by the main ram so that there is remaining a drawing force of 190,000 lbs.

It will thus be seen that there is a definite distinction between the "fluid pressure" as developed by the hydraulic pump and "drawing force" as set forth in the applicant's claims. This distinction has been clearly brought out in Dr. Green's testimony (Appellants' App. 115, 127). This arrangement can be called an arrangement wherein the force is applied in series in accordance with the following diagram.

Ernst's Pump — Single Fluid Line — **Ram and Platen** — **All Hold-downs carried by Platen and Operated by Fluid Pressure Generated by Platen Movement.**

It may appear at first glance that such a diversion of drawing force is wasteful, but actually it is not for this series operation arrangement permits a greater speed of press cycle operation because **the entire flow of liquid from the pump is directed to the ram,** whereby the main ram makes a continuous forward advancement to close upon the workpiece and at the same time clamp the workpiece in preparation for pressing. Also, only the power required to be used for clamping is used for clamping, and the remaining power capable of being produced by the application of the pump pressure upon the main ram is held in abeyance until the metal is actually contacted by the central die on the main ram. There is, however, a continuous diversion of the drawing force by the clamping member preceding the actual drawing operation as well as during the drawing operation because the "drawing force" is always available.

The diversion of the drawing force is even more clearly disclosed in Fig. 3 of the drawings of the Ernst application. The hydraulic press disclosed in this figure does not have a central passage in the ram 22 to supply liquid to the clamping cylinders 37. In this instance the platen 36 has pistons 88 that extend into cylinders 92 that are stationary in the same manner as the cylinder 20 of the ram 22. The pistons 88 have a passage 89 therein connecting the interior of the clamping cylinder 37 with the interior of the cylinder 92. A check valve 94 permits liquid to enter the cylinder 92 from the surge tank 19 while a valve 103 prevents escape of liquid therefrom. Relief valves 97 are connected to the cylinder 92 to relieve clamping pressure above a predetermined valve in the same manner as the relief valves 51 heretofore referred to.

When the pump 30 supplies liquid above the press ram 22 to move the same downwardly liquid enters the cylinder 92 through the check valve 94, filling the cylinder 92 and the clamping cylinder 37. When the hold-down clamp 44 engages the metal blank causing relative movement between the blankholder pistons and cylinders to compress the liquid therein, pressure is generated in the clamping cylinders 37 and the cylinder 92 that is applied upon the end area of the piston 88 which urges the piston 88, the platen 36 and the clamping pistons 38 downwardly.

The diversion of "drawing force" required to generate the clamping pressure within the clamping cylinder is undoubtedly a true diversion because the pressure generated in the clamping cylinder is applied directly to the platen piston 88 to produce the clamping pressure upon the blankholder.

V. PRIOR ART.

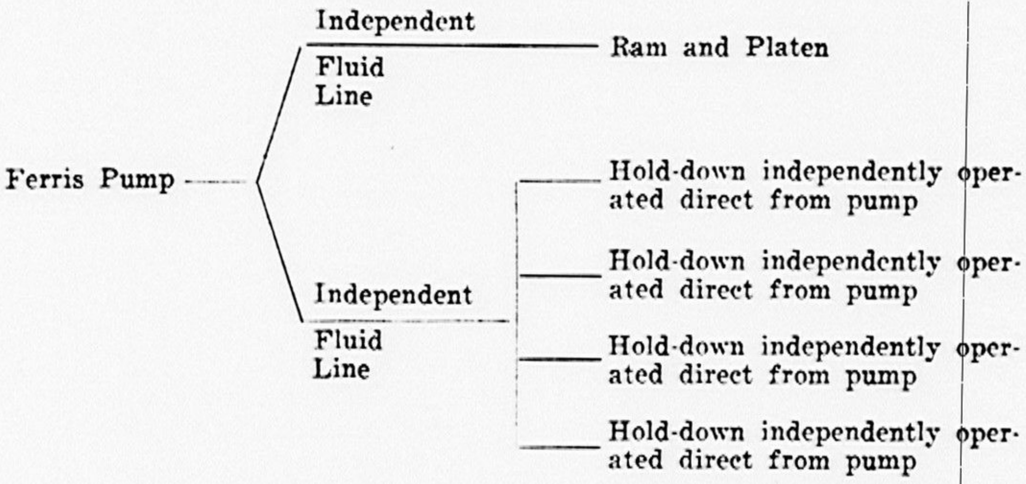
The only prior art relied upon by the Commissioner of Patents is the Ferris patent 1,970,134.

In a normal cycle of operation of the press of this patent (see Figs. 1 and 4) the liquid pump 42 first supplies liquid under pressure to a plurality of clamping ram cylinders 25 to move the clamping rams 24 and the clamping ring 30 for causing the clamping ring to engage a metal blank and clamp the same against the stationary die 7. Liquid is supplied to the clamping cylinders 25 from the pump 42 until a predetermined pressure is reached in the clamping cylinders at which time a pressure relief valve 103 opens to bypass excess pressure. As auxiliary clamping means Ferris provides the sylphons 31 connected in series with the clamping cylinders 25 so that the clamping pressure also exists in the sylphons 31.

After the full clamping pressure is applied upon the clamping ring 30 a suitable liquid control valve is shifted to open a restricted passage to the clamping cylinders whereby liquid under pressure is continuously supplied to the clamping cylinders 25.

The liquid flow control valve is then shifted a second time to supply liquid from the pump 42 to the main ram cylinder 18 through a series of conduits that are entirely independent from the series of conduits through which liquid was supplied to the clamping cylinders 25. The main ram then moves forward to form the metal blank.

This arrangement is one that is known as a parallel flow arrangement from a single fluid pressure source such as indicated in the following diagram.


Independent
Fluid
Line
Ram and Platen
Ferris Pump
Independent
Fluid
Line
Hold-down independently operated direct from pump
Hold-down independently operated direct from pump
Hold-down independently operated direct from pump
Hold-down independently operated direct from pump

In this parallel flow arrangement the fluid pressure stands within the clamping cylinders and the main ram cylinder simultaneously so that if the pump is capable of developing 2000 lbs. pressure, using the pressure of the previous example, the "force" exerted by the clamping rams will be entirely independent of the "force" exerted by the main ram. The mere fact that a single pump supplies fluid pressure to the clamping rams as well as to the main ram does not affect the total "drawing force" capable of being produced and used for a drawing operation by the main ram. If the Ferris main ram is capable of producing a drawing force of 200,000 lbs., using the figures from the previous example, none of this force will be diverted because there is no resistance offered to the advancement of the main ram other than the metal blank. The parallel arrangement of fluid pressures is comparable to the parallel flow of electric current as clearly compared by Dr. Green in his testimony (Appellants' App. 128).

VI. CONCLUSION.

It will now be seen from the foregoing discussion that the court below was in error in the following Finding of Fact:

> "4. In the Ferris system the clamps are actuated by liquid which is diverted from the supply line of the main plunger, and this involves a diversion of the drawing force within the meaning of claims 4, 5 and 7 of the Ernst application here involved." (Finding of Fact No. 4)

The **Ernst** press system **is a series arrangement** wherein the hydraulic pressure for clamping the article is generated by diverting part of the "drawing force" while clamping the article, while the **Ferris** press **is a parallel arrangement** wherein the intensity of the "drawing force" of the main ram is not affected by the force required to clamp the article.

The Finding of Fact by the lower court relating to the retraction cycle of the Ernst press is erroneous because it is not based upon a complete statement of fact.

> "5. It would not require invention to continue the supply of liquid to the clamping means of Ferris during the retraction of the main plunger." (Finding of Fact No. 5)

This Finding omits any mention of the diversion of the retraction force to provide clamping pressure during a part of the retraction stroke of the main ram.

This is very clearly shown in Fig. 3 of the drawings of the Ernst application. When liquid is supplied to the cylinder 20 below the head 23 of the ram 22 to retract the ram, the platen piston 88 is moved upwardly into the cylinder 92. At this time liquid is prevented from escaping from the cylinder 92 so that the relative movement between the piston 88 and the cylinder 92 generates hydraulic pressure within the cylinder 92 that is transmitted through the piston bore 89 into the clamping cylinder 37 to be applied upon the end of the clamping piston 38. The "force" for retracting the main ram 22 is developed by the application of "fluid pressure" from the pump 30 upon the lower face of the piston head 23. Since the platen piston 88 is moved with the ram 22 the generation of hydraulic pressure within the cylinder 92 diverts a portion of the retraction force. This is the same type of diversion of force as referred to in a forward movement of the ram wherein a portion of the "drawing force" is diverted for applying clamping pressure.

This feature is completely undisclosed in the Ferris patent because Ferris has no retraction side on his main ram, all of which was testified to by Dr. Green (Appellants' App. 116, 117).

VII. MATTERS OF LAW.

1. As a matter of law it is respectfully submitted that the Ferris patent does not anticipate the Ernst application because the method of the claims in issue cannot be performed by the apparatus of the Ferris patent without alteration in the normal and inherent operation of the Ferris apparatus.

In *Hartford-Empire Co.* v. *Coe* (App. D. C.) 87 Fed. (2d) 741, the court stated:

> "Method claims can be anticipated only by similar method, and cannot be anticipated by a piece of mechanism by which process might have been formed, or by earlier devices which require alteration to carry out such process, unless such use would have occurred to one whose duty it was to make practical use of mechanism described." (Head Note 2)

> *Carnegie Steel Co. v. Cambria Iron Co.*, 185 U. S. 403.
>
> *Karl Kiefer Mach. Co.* v. *U. S. Bottler's Machinery Co.*, (C. C. A 7) 114 Fed. (2d) 169.

2. As a matter of law a claim containing subject matter that has been shown to have definite utility and improves the operation of an apparatus constructed in accordance with the subject matter of the claim is patentable.

In *United Shoe Machinery Corp.* v. *E. H. Ferree Co. et al.* (C. C. A. 2), 64 Fed. (2d) 101, the court stated:

> "The fact that it may be regarded as a simple change of material does not take away the merits of the patentee's accomplishment. Prior inventors were trying to take care of the objectionable features of the heavy cast-iron arm and did not think of the use of aluminum alloy. This supports the claim of invention. That the art needed a lighter arm gave rise to an incentive which spurred others to work on the problem, and because, after its accomplishment, it seemed so simple, does not defeat the claim of invention." (P. 102)

In re Coykendall (App. D. C.) 29 Fed. (2d) 868.
Diamond Rubber Co. v. *Consolidated Tire Co.*, 220 U. S. 428.
Battery Patents Corp. v. *Coe* (App. D. C.) 93 Fed. (2d) 220.
In re Henry (App. D. C.) 6 Fed. (2d) 699.
Kelly v. *Coe* (App. D. C.) 99 Fed. (2d) 435.

3. In considering the terminology of the claims they should be interpreted in the light of the specification and the language of the claims shall not be extended beyond the language of the specification.

In *Strong-Scott Mfg. Co. et al.* v. *Weller et al.* (C. C. A. 8), 112 Fed. (2d) 389, the court stated:

> "The terms of a claim are understood to refer to and be explained by the structure set forth in the drawings and specifications. American Fruit Growers, Inc. v. Brogdex Co., 283 U. S. 1, 6, 51 S. Ct. 328, 75 L. Ed. 801; Temco Elec. Motor Co v. Apco Mfg. Co., 275 U. S. 319, 330, 48 S. Ct. 170, 72 L. Ed. 298; Carnegie Steel Co. v. Cambria Iron Co., 185 U. S. 403, 432, 22 S. Ct. 698, 46 L. Ed. 968; H. H Robertson Co. v. Klauer Mfg. Co., 8 Cir., 98 F. 2d 150, 153; American Laundry Mach. Co. v. Strike, 10 Cir., 103 F. 2d 453, 457; Texas Rubber & Specialty Corp. v. D. & M. Machine Works, 5 Cir., 81 F. 2d 206, 208." (P. 394).

Schriber Co. v. *Cleveland Trust Co. et al.*, 311 U. S. 211 (Note P. 217).
Peter Hogg et al v. *John B. Emerson*, 18 U. S. 724.
Application of Taylor (App. D. C.), 285 F. 983.

VIII. COMMERCIAL VALUE OF THE INVENTION.

The invention has been one of the vital factors in the commercial success of these presses because of their increased efficiency, as testified to by Mr. Pocock in his deposition. (Appellants' App. 107, 108). Forty-four presses were sold having a sales value of $770,664.60. The List of Sales (Appellants' App. 79, 81, 82) gives evidence of the diversification of the purchases and their importance.

As a matter of law if there is any doubt as to the patent ability of an apparatus or process that has shown to be commercially successful the benefit of the doubt is given to the applicant.

Kurtz v. *Belle Hat Lining Co.* (C. C. A. 2), 280 Fed. 277.
Barbwire Patent Case, 143 U. S. 275.
Loom Co. v. *Higgins*, 105 U. S. 580.
Temco Electric Motor Co. v. *Apco Mfg. Co*, 275 U. S. 319.

IX. CONCLUSION.

In conclusion, we respectfully submit that the decision of the tribunal below should be reversed and all of the doubts which might exist should be resolved in favor of the plaintiffs who having done something new and are only barred from adequate protection by the previous failures of the lower tribunals to award the claims to the plaintiffs. In view of the facts and the law these failures seem contrary to sound reasoning.

Respectfully submitted,

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Appeal from the District Court of the United States for the District of Columbia.

APPENDIX TO BRIEF FOR APPELLANTS.

I.

PLEADINGS, DOCKET ENTRIES AND OTHER PAPERS DESIGNATED BY APPELLANTS.

1 Endorsed: Filed Jul 29, 1940 Charles E. Stewart, Clerk.

District Court of the United States, for the District of Columbia.

Civil Action No. 7743

The Hydraulic Press Corp., a Delaware Corporation of Wilmington, Delaware and

Walter Ernst, c/o The Hydraulic Press Manufacturing Co., Mount Gilead, Ohio, *Plaintiffs*,

v.

Conway P. Coe, Commissioner of Patents, Washington, D. C., *Defendant*.

Complaint for the Issuance of a Patent.

To the Honorable Judges of the District
Court of the United States for the
District of Columbia:

The plaintiffs bring this cause of action and state as follows:

1. The plaintiff, The Hydraulic Press Corporation, Inc., is a corporation organized and existing under the laws of the State of Delaware, having a place of business 2 care of Delaware Charter Company, 900 Market St., Wilmington, Delaware, and the plaintiff, Walter Ernst, is a citizen of the United States, residing at Mount Gilead, Morrow County, Ohio, and the two plaintiffs bring this suit jointly.

2. That the defendant, Conway P. Coe, is Commissioner of Patents of the United States, having his official residence in the District of Columbia and is sued in his official capacity as said Commissioner of Patents of the United States.

3. This suit arises under the patent laws of the United States and this bill is filed in accordance with the provisions of Sec. 4915 of the Revised Statutes, Title 35, Sec. 63 U. S. C. A.

4. That the plaintiff, Walter Ernst, prior to September 16th, 1936, was the true, original and first inventor of new and useful improvements in a Method of Drawing Metal Articles, which were not known or used by others in this country before his invention or discovery thereof and were not patented or described in any printed publication in this or any foreign country before his invention or discovery thereof, or more than two years prior to his application for a patent, hereinafter referred to, and were not in public use or on sale in this country for more than two years
3 prior to said application, were not abandoned, and
were not patented in any foreign country on an application filed by either of said plaintiffs or their legal representatives or assigns more than twelve months prior to the filing of said application in the United States.

5. That the plaintiff, Walter Ernst, being entitled to letters patent of the United States for said improvements in Method of Drawing Metal Articles under the provisions of the statutes of the United States and in accordance with the Rules of Practice of the United States Patent Office, filed an application in due and proper form with the defendant as Commissioner of Patents for said improvements. Said application complied with the statutes and rules in such cases made and provided and was filed in the United States Patent Office on July 19, 1937, and was given Ser. No. 154,365, as will more fully and at large appear by said application or a duly certified copy thereof and of the proceedings relating thereto had in the Patent Office, here in Court to be produced by plaintiffs. Said application Ser. No. 154,365 was a division of application Ser. No. 101,110, filed September 16, 1936, by the plaintiff Walter Ernst.

6. That said Walter Ernst, by an instrument in writing, executed by him and recorded in the records of the Transfers of Patents in the United States Patent Office,
4 sold, assigned and transferred to The Hydraulic
Press Corporation, Inc., the other plaintiff herein, the entire right, title and interest in and to the invention disclosed in said application Ser. No. 154,365, and in and

to the Letters Patent expected to issue thereon, said assignment having been recorded July 19, 1937, whereby said The Hydraulic Press Corporation, Inc. became invested with and now owns the entire right, title and interest in and to said invention and the Letters Patent to issue therefor, all as will more fully and at large appear by said assignment or a duly certified copy thereof in Court to be produced.

7. That said application has been duly prosecuted in accordance with the laws of the United States and the Rules of Practice of the United States Patent Office.

8. That a patent on said application, including and embodying claims 4, 5 and 7, has been refused by the defendant, the Commissioner of Patents.

9. That said application was passed upon by the Primary Examiner, who finally refused said claims 4, 5 and 7 in an action dated July 28, 1939, on the ground that the invention defined by said claims was disclosed by the following Letters Patent:

United States Letters Patent to Ferris, No. 1,970,134, dated Aug. 14, 1934.

5 10. That the plaintiffs believed they were entitled to said claims 4, 5 and 7 and took an appeal, dated October 30, 1939, to the Board of Appeals from the final rejection of these claims by the Primary Examiner on July 28, 1939, said claims reading as follows:

4. A method of generating and utilizing hydraulic power for clamping articles being drawn comprising clamping the article by hydraulic means at its periphery with different pressures at different locations therearound, applying a drawing force to the article while so clamped, diverting a portion of the drawing force to generate hydraulic pressure during the drawing operation, and applying the pressure so generated to produce the clamping action.

5. A method of generating and utilizing hydraulic power for clamping articles being drawn comprising clamping the article by hydraulic means at its periphery with different

pressures at different locations therearound, applying a drawing force to the article while so clamped, diverting a portion of the drawing force to generate hydraulic pressure during the drawing operation, and applying the pressure so generated to produce the clamping action and release the excess pressure at a predetermined maximum.

7. A method of generating and utilizing hydraulic power for clamping articles being drawn comprising clamping the article by hydraulic means at its periphery with different pressures at different locations therearound, applying a drawing force to the article while so clamped, diverting a portion of the drawing force to generate hydraulic pressure during the drawing operation, applying the pressure so generated to assist the clamping action, applying a retracting force to the member applying the drawing force, diverting a portion of the retracting force to generate pressure and applying the pressure thus generated to maintain the clamping pressure during retraction.

6 11. Under date of November 21, 1939, the Primary Examiner filed a statement in response to said appeal to the Board of Appeals, in which he relied upon the prior patent mentioned hereinabove, namely, Ferris, 1,970,134, of August 14 1934, and upon which he relied in finally rejecting said aforementioned claims. All of this will more fully and at large appear by a certified copy of the file wrapper and contents of said Ernst application Ser. No. 154,365 herein referred to, in Court to be produced.

12. That after arguments were duly made on said appeal and a brief filed on behalf of said applicant, the Board of Appeals, on the 12th day of June, 1940, affirmed the decision of the Examiner as to said claims 4, 5 and 7, on the ground that said claims do not patentably distinguish from the reference relied on, namely, the Ferris patent 1,970,134 of August 14, 1934, all as will more fully appear by the certified copy of the file wrapper and contents of said Ernst application, Ser. No. 154,365, in Court to be produced.

13. The plaintiffs aver that the decisions of the Primary Examiner and of the Board of Appeals were erroneous and

contrary to the law and they, therefore, disagree
7 with the decision of the Commissioner of Patents,
acting through the Board of Appeals, as to said
claims 4, 5 and 7, and allege that the subject matter of said claims is new and patentable, and that these claims should be allowed and a patent therefor granted to plaintiffs, but the Commissioner has refused and still refuses to grant letters patent upon the aforesaid claims.

14. That the plaintiffs have taken no appeal to the United States Court of Customs and Patent Appeals from the aforesaid decisions of the Board of Appeals and Commissioner of Patents.

15. Wherefore plaintiffs bring this complaint under and in accordance with the provisions of the statutes (Sec. 4915 U. S. Rev. St.; Comp. Sts. 9460; U. S. C. A. Title 35, Sec. 63) in such cases made and provided, and pray:

(a) That this Honorable Court may adjudge that plaintiffs, The Hydraulic Press Corporation, Inc, and Walter Ernst are entitled, according to law, to receive letters patent of the United States for said invention as specified in the aforesaid claims 4, 5 and 7 of said application Ser. No. 154,365.

(b) That this Honorable Court may decree that the Com-
missioner of Patents be directed to allow the afore-
8 said claims 4, 5 and 7 of said application Ser. No.
154,365 for letters patent, filed by Walter Ernst July
19, 1937.

(c) For such other and further relief in the premises as the nature of the case may require and as to this Honorable Court shall seem meet and proper.

THE HYDRAULIC PRESS CORPORATION, INC., and
WALTER ERNST

By TOULMIN & TOULMIN
Attorneys

JOHN M. MASON
Munsey Bldg.,
Washington, D. C.

H. A. TOULMIN

H. A. TOULMIN, JR.
Mutual Home Bldg.,
Dayton, Ohio
Solicitors and Of Counsel for Plaintiffs.

* * * * * * * * * *

9 *Answer to the Complaint.*

To the Honorable the Justices of the District Court of the United States for the District of Columbia.

1, 2, 3. Defendant admits the allegations of paragraphs 1, 2 and 3.

4. He admits that on September 16, 1936, Walter Ernst, claiming to be the true, original and first inventor of certain alleged new and useful improvements in "Method of Drawing Metal Articles", filed in the Patent Office an application for patent thereon, to which application Serial No. 101,110 was given, and in said application made averments corresponding to the allegations of paragraph 4. He denies that said allegations are sufficient to justify the issuance of a patent containing any of the claims set out in paragraph 10.

5. He admits that on July 19, 1937, said Walter Ernst
filed in the Patent Office an application for patent
10 entitled "Method of Drawing Metal Articles", to
which application Serial No. 154,365 was given. He
admits that said application was filed as a division of application No. 101,110, filed by said Walter Ernst on September 16, 1936. He admits that said applications were in due and proper form and in compliance with existing law.

6, 7, 8, 9. He admits the allegations of paragraphs 6, 7, 8 and 9.

10. He admits that plaintiffs appealed to the Board of Appeals from the rejection of claims 4, 5 and 7 of said application No. 154,365. He admits that said claims are as set out in paragraph 10.

11, 12. He admits the allegations of paragraphs 11 and 12.

13. He admits that he has refused and still refuses to issue to plaintiffs a patent containing any of claims 4, 5 and 7 of said application No. 154,365. He denies that his refusal is wrongful or that plaintiffs are lawfully entitled to the issuance of a patent containing any of said claims since the said claims are deemed to be unpatentable in view of the following prior patent and for the reasons given in the statement of the examiner in answer to the appeal and the decision of the Board of Appeals, copies of which will be furnished at the trial:

Ferris,	1,970,134,	August 14, 1934.

Profert of a copy of this patent is hereby made.

14. He admits the allegation of paragraph 14.

11 15. Paragraph 15 is a prayer to the Court which defendant is not required to answer.

W. W. COCHRAN
Attorney for Defendant.

August 8, 1940.

I hereby certify that a copy of this Answer was mailed to the attorney for plaintiffs on August 8, 1940.

W. W. COCHRAN
Attorney for Defendant.

12 *Stipulation*

It is stipulated by the parties hereto that at the trial and hearing of the above entitled cause in the United States District Court for the District of Columbia, Dr. A. M. Green, Jr. testified on behalf of the Plaintiffs, and the Plaintiffs introduced in evidence the deposition of Paul C. Pocock, taken September 12, 1941, and the Exhibits offered in evidence at the time of taking the said deposition, said Exhibits being as follows:

Pltfs. Ex. 1—Bulletin 3907
Pltfs. Ex. 2—The Hydraulic Press, No. 20
Pltfs. Ex. 3—The Hydraulic Press, No. 32 p. 1-7 inclusive
Pltfs. Ex. 4—The Hydraulic Press, No. 23
Pltfs. Ex. 5—List of sales of Hydraulic presses utilizing invention involved herein
Pltfs. Ex. 6—Ferris patent 1,970,134,
Pltfs. Ex. 7—File wrapper Ser. No. 154,365.

13 and that the defendant introduced a document in the following words and figures:

The Hydraulic Press Corp., Inc. et al v. Coe
Civil Action No. 7743

A—Ferris
B—Print of Drawings,
C—Statement of the Examiner,
D—Decision of the Board of Appeals.

and that no further or additional evidence was introduced by either side, and that the transcript of record on appeal may so show.

It is further stipulated that photostatic reproductions of Plaintiffs' Exhibit No. 5, and Defendant's Exhibit No. 1, may be used in the transcript of record on appeal in this action.

W. W. COCHRAN,
Attorney for Defendant-Appellee.

TOULMIN AND TOULMIN,
Attorneys for Plaintiffs-Appellants.

* * * * * * * * * *

181 Endorsed: Filed Sep 19 1941 Charles E. Stewart, Clerk

Department of Commerce
United States Patent Office

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of the File Wrapper and Contents, in the matter of the Pending Application of Walter Ernst, Filed July 19, 1937, Serial Number 154,365, for Improvement in Method of Drawing Metal Articles.

In United States District Court for the District of Columbia
Civil Action 7743.

THE HYDRAULIC PRESS CORP. INC. & WALTER ERNST,
v.
CONWAY P. COE, Commissioner of Patents

Plaintiffs' Exhibit No. 7

S. W. FROEHLE,
(SEAL) *Notary Public, Montgomery County, Ohio.*

In Testimony Whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington, this tenth day of September, in the year of our Lord one thousand nine hundred and forty-one and of the Independence of the United States of America the one hundred and sixty-sixth.

CONWAY P. COE,
Commissioner of Patents

Attest:
D. C. WILSON,
Chief of Division.

1454

11

NUMBER (Series of 1935)

154365

PATENT No.

1937

DATED

DIV. ~~13~~ 14

5097

(EX'R'S BOOK) K[illegible]

30 – 69

(45)

Name WALTER ERNST

Assr to The Hydraulic Press Corp Inc., of Wilmington, Del, a corp of Delaware

of MOUNT GILEAD

State of OHIO

Invention METHOD OF DRAWING METAL ARTICLES

Division of App., No. Ref. No. 2167944 10/1/10, filed Aug 1, 1939 Sept 16, 1936

	ORIGINAL		RENEWED
APPLICATION FILED COMPLETE	JULY 19, 1937		
PARTS OF APPLICATION FILED: Petition, Specification, Oath, First Fee $30.	JULY 19, 1937		
13 sheets Drawings.			
Prints (Appeal)	Nov 6 1939		
Examined and passed for Issue	, 193	Reexam'd and passed for Issue	, 193
Exr. Div.		Exr. Div.	
Notice of Allowance	, 193 By Commissioner.	Notice of Allowance	, 193 By Commissioner.
Final Fee	, 193	Final Fee	, 193

Attorney TOULMIN & TOULMIN MUTUAL HOME BLDG DAYTON OHIO.

Associate Attorney

No. of Claims Allowed .... Print Claims .... in O.G. Class

Title as allowed

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from the original bound volume

183 Endorsed: Mail Division U. S. Patent Office July 19 1937

Endorsed: U. S. Patent Office July 27 1937 Division 14

TOULMIN & TOULMIN

Attorneys-at-Law, Patents, Patent Causes

#1454

Petition

To the Commissioner of Patents:

Your Petitioner Walter Ernest, a citizen of the United States, residing at Mount Gilead in the County of Morrow and State of Ohio whose Post Office address is c/o The Hydraulic Press Mfg. Co., Mount Gilead, Ohio, prays that Letters-Patent may be granted to him for the improvements in Method of Drawing Metal Articles as set forth in the annexed specification.

And he hereby appoints Toulmin & Toulmin (Harry Aubrey Toulmin and Harry Aubrey Toulmin, Jr.,) Dayton, Ohio his attorneys, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the Letters-Patent, to sign the drawings, and to transact all business in the Patent Office, connected therewith.

WALTER ERNST.

Specifications

To All Whom It May Concern:

Be It Known, That I, Walter Ernest, a citizen of the United States, residing at Mount Gilead in the County of Morrow and State of Ohio have invented certain new and useful improvements in Method of Drawing Metal Articles of which the following is a specification, reference being had therein to the accompanying drawing:

184 This invention relates to methods of working articles,
and particularly to methods of drawing articles of
metal or the like.

One object of this invention is to provide a method of drawing articles, wherein the article is clamped at its periphery with different pressures at different locations while the drawing force is applied to the article, so that irregular workpieces may be held with varying pressures at different parts of their peripheries.

Another object is to provide a method of drawing articles, wherein the piece of material or blank is clamped near its periphery at a plurality of clamping points, at different locations thereon, while the drawing force is applied to the article, then generating clamping fluid pressure by the action of the drawing force and applying a portion of the pressure fluid so generated to assist the drawing action.

Another object is to provide a method of drawing ar-
ticles consisting in clamping the article at its periphery
with different pressures at different locations while
185 while applying a drawing force to the article, and
causing the action of the drawing force to generate
pressure fluid for the clamping action, a portion of this
pressure fluid so generated being caused to balance a part
of the load exerted by the clamping action.

This is a division of my copending application, Ser. No. 101,110, filed September 16, 936.

In the drawings:

Figure 1 is a diagrammatic view, mainly in section, showing the working elements of a typical hydraulic drawing press circuit by which the method of this invention may be practiced, with the upper portion of the press framework omitted to disclose the construction more clearly.

Figure 2 is a horizontal section along the line 2-2 in Figure 1.

186 Figure 3 is a view similar to Figure 1, but show-
ing another form of hydraulic drawing press circuit
for practicing the method of this invention.

Figure 4 is a diagrammatic plan view showing the connections between the various cylinders of the press of Figure 3.

Figure 5 is a view of a portion of Figure 3, showing a further modified construction of the clamping cylinder in a hydraulic press drawing circuit for practicing the method of this invention.

Figure 6 is a vertical section through a pressure relief valve employed in connection with the hydraulic press circuit shown in Figure 1.

In general, the method of this invention is found convenient in forming articles of irregular shape, and is especially valuable in the drawing of metal articles. The method includes applying different clamping pressures at
187 different locations around the periphery of the piece of material or blank, while exerting the forming or drawing pressure upon the blank. Optionally, the action of the drawing force is employed to generate pressure fluid for carrying out this clamping action, and by a further option, a portion of the pressure fluid so generated may be used to balance a part of the load exerted by the clamping action.

Referring to the drawings in detail, Figure 1 shows diagrammatically a hydraulic drawing press circuit by which the method of this invention may be practiced. The hydraulic drawing press circuit consists of a base member 10 connected to a top member 11 (reduced in size for clearness of showing) by means of tie rods 12, the latter being secured in position by means of the nuts 13 upon the ends thereof. Mounted in the base member 10 is a drawing die 14 having a die cavity 15 for receiving the blank 16. Associated with the die cavity 15 is a plunger 17 adapted to support the tip of the blank as it is being drawn, and passing through a bore 18 to its operating cylinder (not shown). The details of the supporting plunger 17 form no part of the present invention, and are shown in my copending application, Ser. No. 74,742, filed April 16, 1936.

The present invention may be employed either with flat blanks or with blanks which have already been subjected to one or more drawing operations. For convenience of disclosure, blank 16 is shown as having been subjected
188 to one drawing operation, and in position for another
drawing operation which will elongate it and cause it to be drawn downwardly into the die cavity 15.

Associated with the top member 11 of the press is a surge tank 19 for containing the fluid by which the press is actuated. Also associated with the top member 11 is the drawing or main cylinder 20, having a bore 21 therein within which reciprocates the double-acting drawing plunger 22 having a piston head 23 thereon. The cylinder 20 is provided with upper and lower ports 24 and 25 on opposite sides of the piston head 23, and adapted by means of pipes 26 and 27 to supply pressure fluid to advance or retract the drawing plunger 22, according to the manner in which the four-way valve 28 is manipulated. This valve 28 is of any suitable type known to those skilled in the art, and its details form no part of the present invention.

Leading from the four-way valve 28 is the pressure line 29 connected at its opposite end to the pump 30. A discharge line 31, also connected to the four-way valve 28, leads into the interior of the surge tank 19. The pump 30 is also provided with a suction line 32, likewise leading into the interior of the surge tank 19. The drawing cylinder 20 is supplied near the mouth of its bore 21 with a packing ring 33, beyond which is a packing 34 adapted to be compressed by a gland 35 so as to prevent leakage around
189 the drawing plunger 22. Connected to the drawing
plunger 22 is the platen 36, within which are arranged the clamping cylinders 37 having clamping plungers 38 operating therein. Each clamping plunger 38 is provided with a packing 39 and gland 40 for the prevention of leakage. Secured to the platen 36 is a drawing plunger or punch 41 having a nose portion 42 corresponding to the die cavity 15, and adapted to pass through an aperture 43

in the clamping member 44 secured to the outer ends of the clamping plungers 38.

Each of the clamping plungers 38 is provided with a fluid passageway 45 leading by way of an outwardly opening check valve 46 to a common passageway 47, which extends upwardly through the drawing plunger 42 and opens into the drawing cylinder bore 21 immediately beneath the drawing plunger head 23. Consequently, fluid is free to pass from the pull-back or return side of the drawing plunger 23 into the clamping cylinders 37, but is prevented from passing in the opposite direction by the action of the check valves 46. Also passing outwardly from each clamping cylinder 37 is a fluid conduit 48 leading to an intermediate portion of a pipe 49, having on one end a safety valve 50 and on the other end a pressure relief valve 51. Leading from the discharge side of the safety valve 50 is a discharge line 52 connected to the discharge side of the relief valve 51 by the line 53.

The discharge line 52 passes upwardly into the telescoping cylinder 54, thereby forming a slip connection, enabling the telescoping cylinder 54 and the pipe 52 to move vertically relatively to each other, an action which necessarily occurs when the platen 36 moves downwardly in response to the action of the drawing plunger 22. A discharge line 55 leads from the telescoping cylinder 54 into the interior of the surge tank 19 and serves to discharge fluid expelled from the pressure relief valve 51 of the safety valve 50. The safety valve 50 is provided merely as an additional safety feature in the event of a jamming or other failure of the pressure relief valve 51, and is set at a higher pressure than the relief valve 51 so as to operate in case of the accumulation of a dangerous pressure within the corresponding clamping cylinder 37 and a failure of the corresponding pressure relief valve 51 to act. It will be seen from Figures 1 and 2 that each clamping cylinder is provided with its own pressure relief valve 51 and safety valve 50 so that a different pressure release point may be given to each clamping cylinder. The pressure relief valves 51 are connected to the drawing plunger passageway 47 by conduits 56 for the purpose of counteracting the action of the relief valves 51 during the return stroke of the drawing plunger 22, as is discussed below in connection with the description of the details of the relief valve 51.

The relief valve 51 is shown in vertical section in Figure 6, and consists of a casing 60 having a bore 61 within which reciprocates a valve plunger 62. Arranged between
191 the valve plunger 62 and the bore 61 is a tubular
member 63 having a longitudinal bore 65 and a cross bore 66, communicating therewith and opening into a transverse bore 67 in the casing 60. The end connection of the pipe 49 is held in communication with the bore 61 by means of the collar 68 engaging the threaded portion 69 of the casing 60, whereas the end of the pipe 53 is similarly held in communication with the transverse bore 67 by means of the threaded collar 70 engaging the threaded portion 71 of the casing (Figure 6).

Mounted on the upper portion of the casing 60 is a tubular cap 72 secured thereto by screws 73. Within the cap 72 is a coil spring 74, one end of which engages an enlargement 75 upon the upper end of the valve plunger 62, whereas the opposite end engages a button 76 in contact with an adjusting screw 77 threaded through a bore 78 in the upper end of the cap 72. Surrounding and covering the adjusting screw 77 is a hollow nut 79 which serves to protect the adjusting screw 77 and also to lock it in its adjusted position. The cap 72 is provided with a port 80 receiving and communicating with the pipe 56 leading to the pull-back side of the drawing plunger 22, as shown in Figure 1.

Thus, when the same pressure fluid is admitted simultaneously to the valves 51, by way of the pipes 49 and 56 during the pull-back stroke of the press, the valve
192 plunger 62 will be prevented from opening by means
of this counteracting arrangement, as is more fully described under the operation thereof. The pipe 56 also

serves during the return stroke of the press to receive and transmit the fluid which leaks into the interior of the cap 72 past the valve plunger 62. Thus, each safety valve 51 may be adjusted to discharge pressure fluid at different predetermined pressure by differently adjusting the adjusting screw 77 to compress the springs 74 by different amounts. The clamping member 44 is provided with rods 81 passing through the vertical bores 82 in the platen 36, and having the nuts 83 on the upper ends thereof. The rods 81 limit the extent to which the clamping member 44 can move relatively to the platent 36.

In the operation of the form of press shown in Figures 1 and 2, the pump 30 is started and delivers pressure fluid to the four-way valve 28, which in turn, is set to deliver pressure fluid through the line 26 and port 24 into the space above the drawing plunger head 23. This pressure forces the drawing plunger 22 and platen 36 downwardly, carrying with them the clamping member 44. When the latter engages the periphery of the blank 16 and clamps it tightly against the die member 14, the clamping member 44 halts, but the platen 36 continues to move downwardly, forcing its drawing die or punch 41 into engagement with the blank
16. As the punch 41 moves downwardly it forces the
193 central portion of the blank 16 into the die cavity 15
and overcomes the resistance of the supporting plunger 17, which protects the tip of the workpiece or blank 16.

Meanwhile, pressure has been built up in the clamping cylinders 37 by reason of the relative motion between the platen 36 and the clamping member 44 to which the clamping plungers 38 are attached, and the fluid in the clamping cylinders 37 has been prevented from escaping by the closing of the outwardly opening check valves 46. When the pressure within each clamping cylinder 37 reaches the amount for which its corresponding relief valve 51 is set, the latter opens and discharges fluid through the line 53, into the discharge line 52 leading to the telescoping cylinder 54, and thence by the line 55 to the surge tank 19. In this manner each clamping plunger 38 may be caused to exert a different force upon the portion of the blank periphery which is engaged by the clamping member 44 in its vicinity.

When the drawing stroke of the press has been completed the setting of the four-way valve 28 is reversed so that pressure fluid flows through the line 27 and port 25, into the space beneath the drawing plunger head 23, causing the drawing plunger 22 to move upwardly. A portion of this pressure fluid, however, passes downwardly through the plunger passageway 47, the outwardly opening relief valves
46, to the passageways 45, into the clamping cylinders
194 37, causing their plungers 38 and the clamping mem-
ber 44 to remain in clamping engagement with the blank 16 while the punch or drawing die 41 is withdrawn from the cavity 15 of the die 14. If the relief valves 51 have been set for a low clamping pressure it would, at first glance, seem that pressure fluid during the pull-back stroke would pass from the clamping cylinders 48 through the relief valve 51 and lines 52, 53 and 55, back into the surge tank 19, thus preventing the return of the moving parts. This, however, is prevented by the operation of the pipe line 56 leading from the valve cap 72 of the valve 51 to the passageway 47 within the drawing plunger 22. Consequently, during the pull-back stroke pressure fluid is applied simultaneously upon opposite sides of the valve plunger 62 within the relief valve 51, and prevents its opening regardless of how low a clamping pressure is provided by the setting of each relief valve 51. When the platen 36 has moved upwardly along the rods 81 it will engage the nuts 83 and lift the clamping member 42 free from engagement with the workpiece 16, thereby enabling the operator to remove the workpiece and also lifting the entire platen and blank holder assembly as a unit.

The modified form of press shown in Figures 3 and 4 has a base portion 10, tie rods 12, die 14 and supporting plunger 18 similar to those of the press shown in Figure 1. A

pump 30 and four-way valve 48 are similarly pro-
195 vided, and the latter has similar forward and re-
verse pressure lines 26 and 27, respectively, leading to the opposite sides of the drawing plunger head 23 within the drawing cylinder 20. Other corresponding parts are given like reference numerals. In this form of press, however, the drawing plunger 22 is of solid construction, and the clamping plunger cylinders 37 are provided with passages 87 leading into tubular plungers 88 mounted upon the upper side of the platen 36, and having bores 89 therethrough. The hollow plungers 88 pass through glands 90 and packings 91 into cylinders 92 arranged on the press top member 11 and within the surge tank 19. From each cylinder 92 the line 93 leads through the check valve 94 to the interior of the surge tank 19. Each check valve 94 opens in the direction of the cylinder 93 so that the latter may draw in fluid upon the descent of the hollow plungers 88. The check valves 94, however, will close upon the ascent of the plungers 88.

From each cylinder 92 a T-shaped line 95 also leads to a safety valve 96 and a pressure relief valve 97. These valves 96 and 97 are similar to the safety valves 50 and pressure relief valves 51 described in connection with Figure 1, with the exception of the fact that the connection 56 to the port 80 in the valve 72 is omitted. The valves 96 and 97 discharge into the discharge line 98 leading to the interior of the surge tank 19. A pressure guage 99 is pro-
vided in each line 95 to indicate the pressure existing
196 in the clamping cylinder 37. Extending from each
cylinder 92 is a line 100 having therein a check valve 101 opening in a direction away from the cylinder 92. Beyond the check valves 101 the lines 100 join a common line 102 leading to a normally open valve 103, having a discharge line 104 leading therefrom to the surge tank 19. The valve 103 is provided with a valve rod 105 having an adjustable stop 106 thereon adapted to be engaged by the end 107 of a platen arm 108 secured to the platen 36. The platen 36 is provided with bores 109 adapted to receive the

rods 110, the lower ends of which are secured to the clamping member 44, and the upper ends of which are provided with nuts 111 threaded thereon. The upper ends of the rods 110 are also provided with threaded sockets 112 in which are inserted the threaded rods 113. This arrangement enables an adjustment of the effective length of the rods 110 and enables the point at which these rods 110 serve as knock-out rods to be varied as desired.

In ordinary drawing presses it will be seen that during a drawing operation the pressure exerted by the clamping plungers 38 and the clamping member 44 is subtracted from the useful drawing force exerted by the drawing plunger 22 because the drawing plunger 22 must overcome the intensified pressure on the clamping plungers 38 within the clamping cylinders 37. Where the clamping pres-
197 sures are low, the effect of this arrangement is not
serious. If, however, a high pressure is employed for clamping the blanks the reduction in drawing force by the withdrawal of force for the clamping plungers may be quite serious. It is for this reason that the modified arrangement shown in Figure 3 was devised. The pressure generated by the relative motion between the platen 36 and the halted blank holder or clamping member 44 still prodaces the blank holder clamping pressure, but this pressure now flows through the hollow plungers 88 and helps to advance the platen 36 by operating on the annular heads of the plungers 88. Any desired proportion of the pressure on the clamping plungers 38 can thus be balanced, and the main or drawing plunger 22 will only have to overcome the difference between the pressures on the ends of the plungers 38 and 88. In this manner it is possible to exert very great clamping pressures with comparatively small main or drawing plunger pressures.

In the operation of the press and circuit shown in Figures 3 and 4, the pump 30 is started and valve 28 is set to discharge pressure fluid through the forward line 26 leading to the space above the drawing plunger head 23. The drawing plunger 22 then moves downwardly, carrying with it

the platen 36 and the hollow plungers 88. The suction thereby created in the cylinders 92 opens the check valves 94 and causes fluid to be drawn into the cylinders from the surge tank 19. When the blank holder or clamping
198 member 44 descends to a point where it engages the
workpiece 16, however, a relative motion occurs between the now halted blank holder 44 and platen 36 as the latter continues to advance and move its drawing die or punch 41 into engagement with the workpiece 16.

Pressure thus accumulates in the clamping cylinders 37 and is transmitted through the passages 89 of the hollow plungers 88 into the cylinders 92. Normally this pressure would be free to pass through the lines 100, check valves 101, line 102, normally open valve 103 and line 104 into the surge tank 19. By this time, however, the platen 36 has descended to a point whereat the end 107 of the platen arm 108 has engaged the stop 106 and moved the valve rod 105 downwardly, thereby closing the normally open valve 103 and cutting off this means of escape for the fluid from the cylinders 92. The check valves 94 in the lines 93 also close against the pressure in the cylinders 92. This leaves the lines 95 as the sole means of escape for the fluid. Consequently, when the pressure in each line 95 exceeds the setting of its relief valve 97, the latter will open and discharge fluid through its discharge line 98 into the surge tank 19. In the event that the pressure relief valve 97 jams or fails for other reasons, the safety valve 96, which is set for a higher pressure, will open and discharge the fluid, thereby preventing damage to the press. By adjusting the relief valves 97 to discharge at different pressures the clamping cylinders 37 and their clamping plungers 38 may be caused to exert different clamping pressures upon the clamp-
199 ing member or blank holder 44, and hence, apply dif-
ferent amounts of pressure to different points on the periphery of the workpiece 16. The check valves 101 prevent the equalization of pressures between the several cylinders 92, consequently, the intensified pressure built up in the clamping cylinders 37 acts against the clamping

plungers 38 to clamp the workpiece 16. At the same time a portion of this pressure fluid passing through the bore 89 of each hollow plunger 88 acts against the annular top surface thereof, and urges each plunger 88 in a downward direction, thereby assisting the action of the main or drawing plunger 22.

As soon as the drawing operation has been completed the operator shifts the four-way control valve 28 to cause the pump 30 to discharge pressure fluid through the line 27 into the space beneath the drawing plunger head 23. This pressure raises the drawing plunger 22 and the platen 36, together with the hollow plungers 88. At the start of this operation, however, the platen arm 108 is still holding the normally open valve 103 in a closed position, hence, the plungers 88 cannot return against the pressure already built up in the cylinders 92 without displacing fluid into the clamping cylinders 37 within the platen 36. This pressure fluid, so displaced, acts against the clamping plungers 38 and tends to separate the platen 36 and the clamping member or blank holder 44 until both have traveled a distance sufficient to enable the platen arm 108 to release the stop 106 upon the valve rod 105 and permit the valve 103 to resume its normally open position. When this occurs the fluid can escape from the cylinders 92 through the lines 100, the check valves 101, the line 102, the valve 103 and the line 104 into the surge tank 19, permitting the entire assembly to execute its return stroke. The adjustable arrangement shown on the rods 110 serves to separate the platen 36 and the blank holder 44 in a positive manner in case both of these should be held together by reason of the workpiece 16 adhering to the drawing die or punch 41.

Thus by the present invention a full blankholding pressure can be exerted by supplying only a fraction of it by means of the main or drawing plunger 22, through the aid of the hollow plungers 88. The arrangement of the check valves 101 and the normally open platen-closed valve 103 enables the pressure to be released through the single valve

103 without, however, equalizing the pressures in the cylinders 92. Without the check valves 101 the pressures in all cylinders would equalize, thereby defeating the purpose of the individual relief valves 97.

In the arrangement shown in both forms of presses in Figures 1 and 3, respectively, the main or drawing cylinder 20 has been shown arranged for descent merely by pressure from the pump 30 through the line 26. It will be understood, however, that a surge valve may be mounted in the
top of the cylinder 20 and operated in the manner
201 shown in my copending application, Ser. No. 74,742,
filed April 16, 1936, thereby enabling the descent of the drawing plunger 22 by gravity and the prefilling of the cylinder 20 through such a surge valve. This surge valve has been omitted from the present circuits for the purpose of simplifying the showing.

The modified construction shown in Figure 5 has the same purpose as the hollow plungers 88 and cylinders 92 in Figure 3. In this arrangement, however, the blank holder or clamping member 44 is provided with clamping cylinders 116 in upwardly projecting portions 117 adapted to enter corresponding recesses 118 in the platen 36. Glands 119 and packings 120 prevent the escape of fluid from around the hollow clamping plungers 121, these being mounted in bores 122 in the upper walls of the recesses 118 in the platen 36. Each plunger 121 is provided with an enlargement 123 adapted to engage the upper or end wall of the recess 118. Formed integral with the clamping plungers 121, in this arrangement, and extending vertically upward therefrom are the hollow plunger portions 124 leading into the cylinders 92, previously described. While this construction is a modification of that shown in Figure 3, the operation is substantially identical and requires no additional description.

It will be understood that a separate pressure may be
applied to each clamping plunger by employing a
202 different pump for each clamping plunger rather
than a single pump with four different pressure re-

lief valves. In this manner each pump may be set to deliver the predetermined and desired pressure to its own particular clamping plunger. In Figure 3, instead of the hollow plungers shown, solid plungers may be used with any suitable arrangement for conducting fluid from the clamping cylinders 37 to the cylinders 92, such as, for example, a flexible conduit.

It will be understood that I desire to comprehend within this invention such modifications as come within the scope of the claims and the invention.

203 Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A method of drawing metal articles comprising clamping the article at its periphery with different pressures at different locations thereon, and applying a drawing force to the article while so clamped.

2. A method of drawing metal articles comprising clamping the article at its periphery with different pressures at different locations thereon, applying a drawing force to the article while so clamped, generating clamping fluid pressure by the drawing action, and applying a portion of the pressure fluid so generated to assist the clamping action.

3. A method of drawing metal articles comprising clamping the article at its periphery with different pressures at different locations thereon, applying a drawing force to the article while so clamping, generating clamping fluid pressure by the drawing action, and applying a portion of the pressure fluid so generated to balance a part of the load exerted by the clamping action.

4. A method of generating and utilizing hydraulic power for clamping articles being drawn comprising clamping the article by hydraulic means at its periphery with different
pressures at different locations therearound, apply-
204 ing a drawing force to the article while so clamped,
diverting a portion of the drawing force to generate
hydraulic pressure during the drawing operation. and ap-

plying the pressure so generated to produce the clamping action.

5. A method of generating and utilizing hydraulic power for clamping articles being drawn comprising clamping the article by hydraulic means at its periphery with different pressures at different locations therearound, applying a drawing force to the article while so clamped, diverting a portion of the drawing force to generate hydraulic pressure during the drawing operation, and applying the pressure so generated to produce the clamping action and release the excess pressure at a predetermined maximum.

6. A method of generating and utilizing hydraulic power for clamping articles being drawn comprising clamping the article by hydraulic means at its periphery with different pressures at different locations therearound, applying a drawing force to the article while so clamped, utilizing a portion of the drawing force to generate pressure fluid during the drawing operation, applying the pressure fluid so generated to assist the clamping action, and discharging the excess pressure fluid at a plurality of the clamping locations when the pressure of the pressure fluid at said clamping locations reaches a predetermined maximum.

7. A method of generating and utilizing hydraulic power for clamping articles being drawn comprising clamping the article by hydraulic means at its periphery with different pressures at different locations therearound, applying a drawing force to the article while so clamped, diverting a portion of the drawing force to generate hydraulic pressure during the drawing operation, applying the pressure so generated to assist the clamping action, applying a retracting force to the member applying the drawing force, diverting a portion of the retracting force to generate pressure and applying the pressure thus generated to maintain the clamping pressure during retraction.

8. A method of drawing articles comprising independently clamping the article hydraulically at spaced locations along its periphery with different pressures at said locations, preventing the equalization of pressures between said

locations, applying a drawing force to the article while so clamped, utilizing a portion of the drawing force to generate pressure fluid during the drawing operation, and applying the pressure fluid so generated to assist the clamping action.

9. A method of drawing articles comprising applying a
drawing force to the article while utilizing a portion of the
drawing force to generate pressure fluid, and simul-
206 taneously applying the generated pressure fluid to
clamp the article at its periphery.

10. A method of drawing articles comprising applying a drawing force to the article while utilizing a portion of the drawing force to generate pressure fluid, simultaneously applying the generated pressure fluid to clamp the article at its periphery, and releasing the clamping pressure fluid at different predetermined pressures at different locations around the periphery of the article.

207 In Testimony Whereof, I affix my signature.

Inventor

WALTER ERNST

Oath

State of Ohio
County of Morrow ss.

Walter Ernst, the above-named petitioner, being duly sworn, deposes and says that he is a citizen of the United States of America, and resident of Mount Gilead in the County of Morrow and State of Ohio and that he verily believes himself to be the original, first and sole inventor of the improvement in Method of Drawing Metal Articles described and claimed in the annexed specification; that he does not know and does not believe that the same was ever known or used before his invention or discovery thereof; or patented or described in any printed publication in any country before his invention or discovery thereof; or more than two years prior to this application, or in public use or on sale in the United States for more than two years prior to this application; that said invention had not been patented in any country foreign to the United States on an application filed by him or his legal representatives or assigns more than twelve months prior to this application; and that no application for patent on said improvement has been filed by him or his representatives or assigns in any foreign country.

WALTER ERNST.

Sworn to and subscribed before me this 12 day of July, 1937.

H C MOZIER

(Seal) *Notary Public, Morrow County, Ohio.*

Acknowledgment should be made before a Notary Public, who must attach his seal. If, however, the oath is taken before a Justice of the Peace, a certificate of the nearest Judge or Clerk of the Court, showing that said Justice is qualified must be attached.

Print of drawing as originally filed. 2

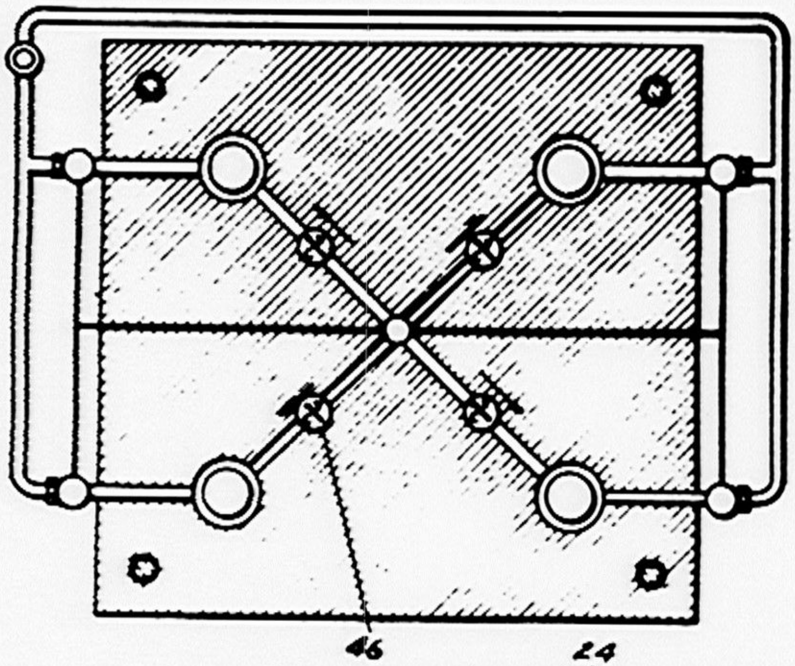


FIG. 2

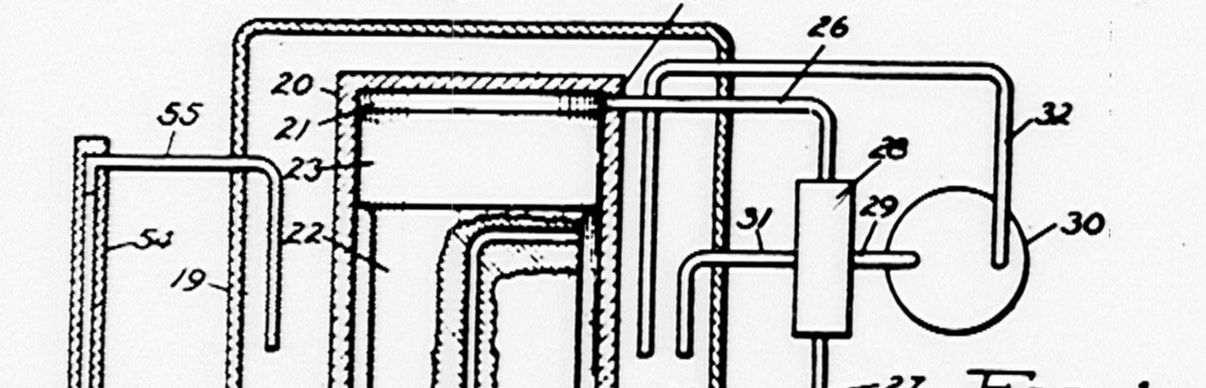


FIG. 1

INVENTOR.
WALTER ERNST
BY Toulmin & Toulmin
ATTORNEYS.

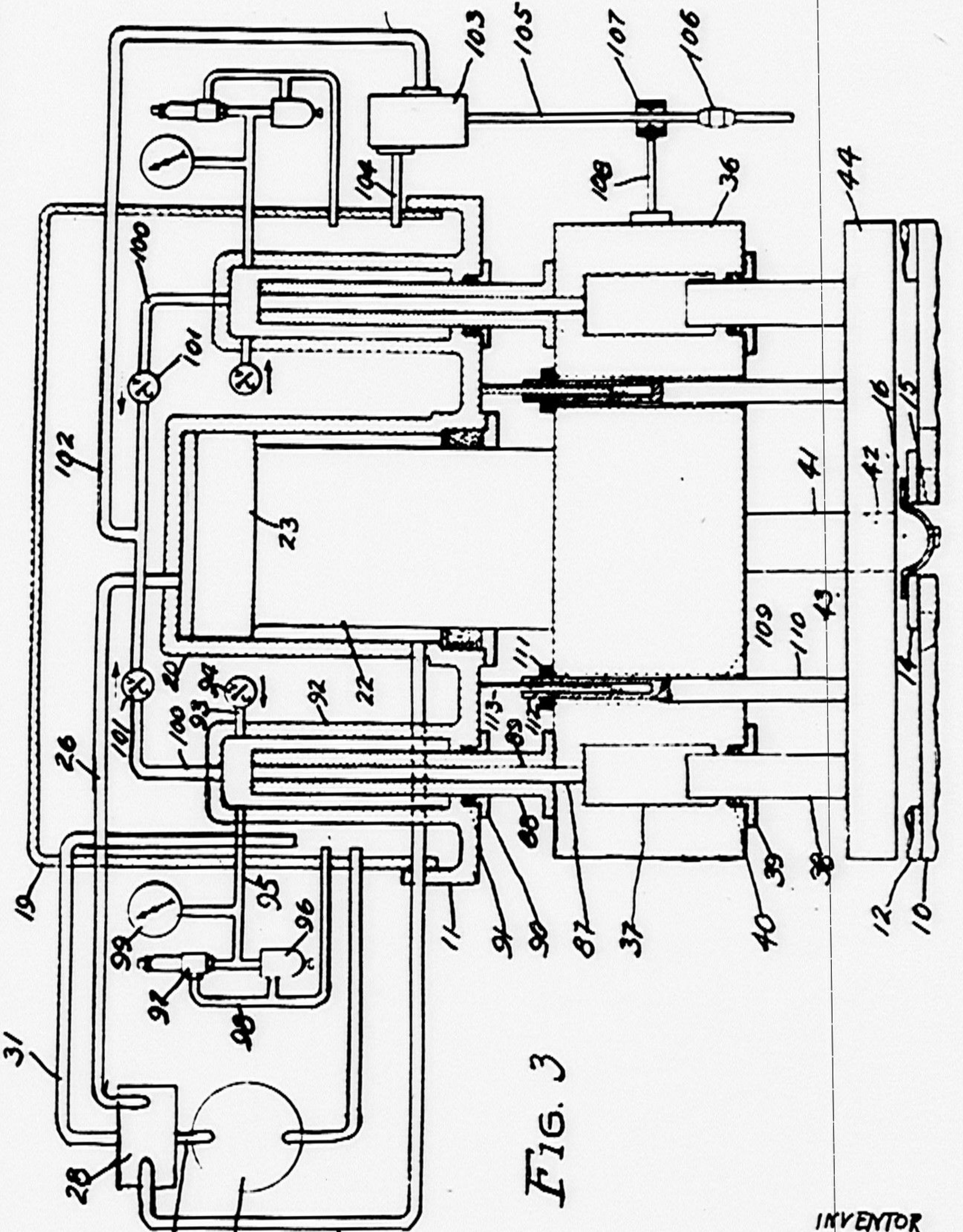


FIG. 3

INVENTOR
WALTER ERNST
BY
ATTORNEYS

[illegible] drawing as
originally [illegible]

FIG. 4

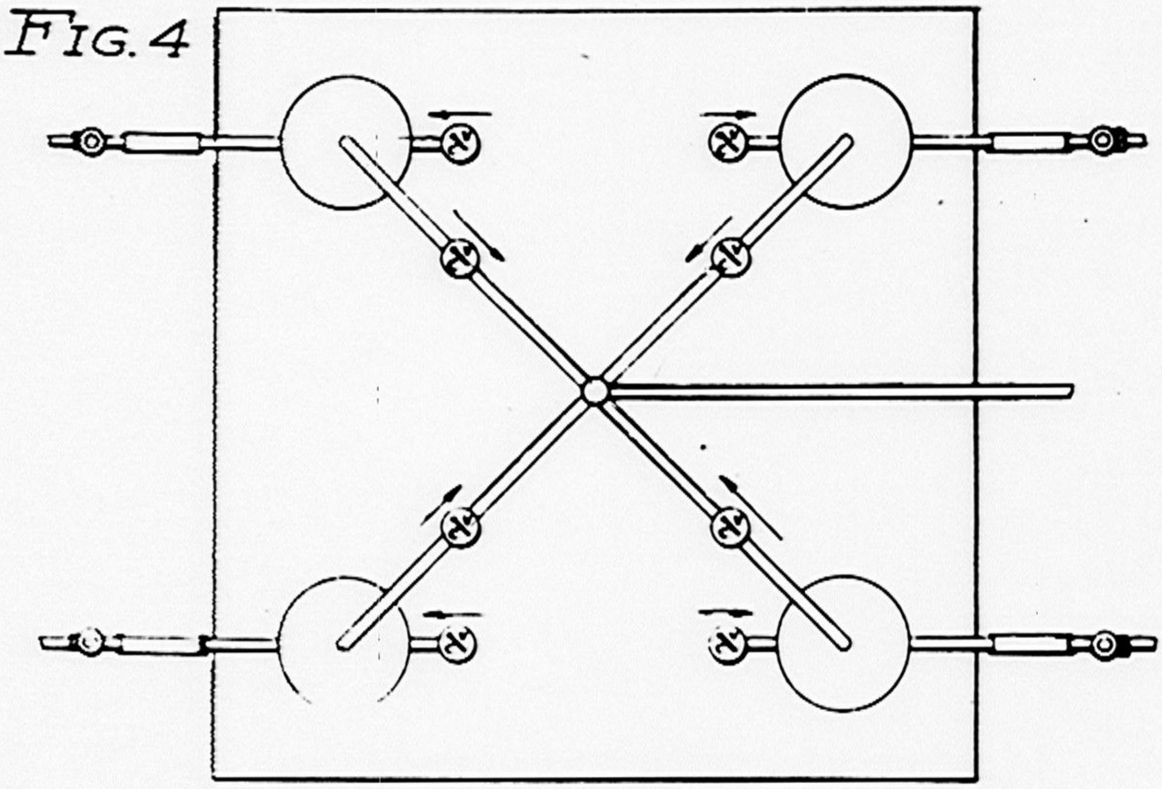


FIG. 5

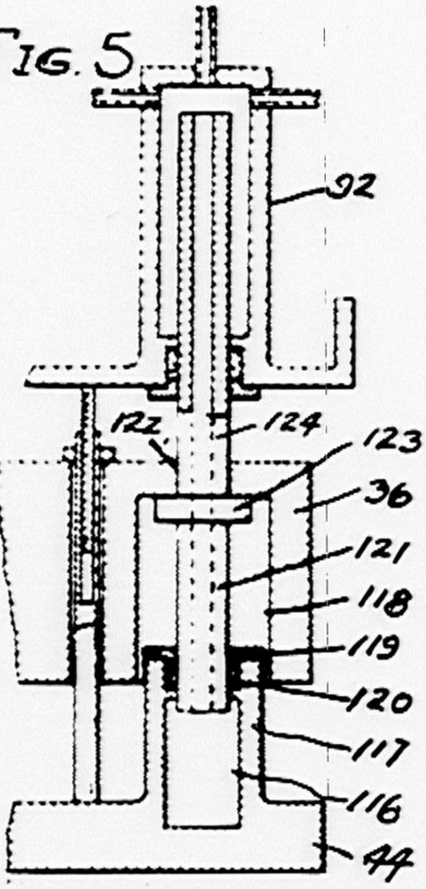
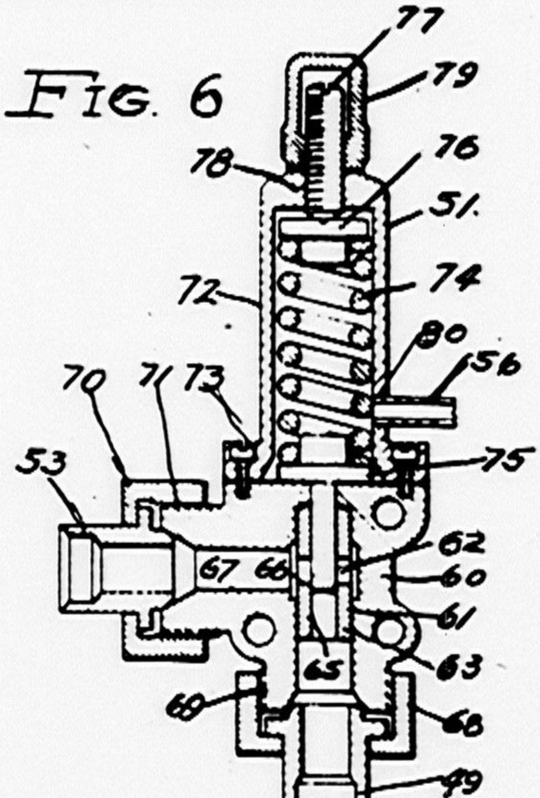


FIG. 6



INVENTOR.
WALTER ERNST

BY Toulmin & Toulmin
ATTORNEYS

211 Endorsed: Mailed Oct 9 1937

Div. 14 Room 5097 (Manian) Paper No. 3

Department of Commerce
United States Patent Office
Washington

October 9, 1937

Applicant: W. Ernst
Ser. No. 154,365
Filed July 19, 1937
For: Method of Drawing Metal Articles

Toulmin and Toulmin
Mutual Home Building
Dayton, Ohio

This application has been examined and the following references are cited:

	Ogden et al.	1,424,671	Aug. 1, 1922	113-45
	Ogden et al.	1,431,175	Oct. 10, 1922	113-45
	Hothersall	1,967,245	July 24, 1934	113-45xr
	Ferris	1,970,134	Aug. 14, 1934	113-45
	Ernst	2,067,265	Jan. 12, 1937	113-45
(Fr.)	NAPPEE et al	542,769	Pub. Apr. 21, 922 (Del. May 22, 1922) (4 pages sp.) (2 shts. drg.)	113 45

The Chief Draftsman has made the following criticism of the drawing: Lines blurred in parts, and circles around numerals objectionable, can be corrected.

Claim 1 is rejected as completely met in terms by Ferris.

Claims 2 through 10 are rejected on Ferris. This reference discloses the method of drawing by hydraulically clamping the blank at its periphery with different pressures at different locations therearound, and thereafter applying a drawing force to the article while so clamped. The remaining limitations in these claims are directed to the function or mode of operation of a machine. It is not seen that the recited function or mode of operation has anything to do with the drawing process. From the point of view of the method of making an article, it doesn't appear to make any difference how the clamping pressures are obtained, whether directly from a source of supply or generated by the drawing action as recited in these 212 claims. The principal and only consideration in the method is the application of different clamping pressures, however obtained, around the periphery of the blank during the drawing operation. These limitations are therefore held not to patentably distinguish these claims over the reference.

The remaining references are cited to show further the state of the art.

G. A. SMITH,
Examiner.

213 Endorsed: Mail Division Apr 4 1938 U. S. Patent Office

Endorsed: U. S. Patent Office Apr 5 1938 Division 14

United States Patent Office

Div. 14, Room 5097.

In the application of
Walter Ernst,
Ser. No. 154,365,
Filed July 19, 1937,
For Method of Drawing
Metal Articles.

Hon. Commissioner of Patents,
Washington, D. C.

Sir:

In response to the Official action of October 9, 1937:
Please cancel Claim 1.

In Claim 2, line 7, cancel "drawing" and substitute—clamping—.

Remarks

The drawings will be corrected upon the finding of an allowable claim.

Claim 1 has been cancelled, not because of the art, but because the remaining claims cover the principal features of the invention.

214 Reconsideration is respectfully asked for Claims 2 to 10, inclusive, over their rejection upon Ferris, with the added implication that they are directed to the function or mode of operation of a machine. The applicant is unable to determine from the Examiner's language whether he is directly rejecting these claims on this ground, or merely upon the art, since such a statement is not positively made. Ferris, however, clearly lacks any disclosure of generating clamping fluid pressure by the drawing action, and applying a portion of the pressure fluid so generated to assist the clamping action. It is not seen that this language expresses the mere function of a machine because many different types of machine could be employed to carry out this procedure. The latter is not in any way dependent upon the particular machine employed, and under such circumstances the decided cases are in agreement that such claims are patentable and are not for the mere function of the machine.

For example, in ex parte Coberly, 8 U. S. Pat. Q. 239 (2nd syllabus), the Board of Appeals held:

> "While relationship between apparatus and process is close yet when it would be possible to practice process by use of apparatus other than that involved in article claims, it is practice of Office to allow process claims as not similar function of apparatus."

Furthermore, in ex parte Lorenz, 11 U. S. Pat. Q. 105, on page 107, the Board of Appeals, under similar circumstances, stated:

215 "We regard the method claims something more than a mere statement of the function of a particular machine. While mechanism is undoubtedly necessary to carry out the methods claimed, such mechanism is obviously capable of rather wide variation. The process and mechanism are intimately related but we see no objection to defining any advance made by the claims of each type so long as they are not unduly multiplied."

Finally, claims of the type recited in the present application have been held valid and infringed in court procedure, even though these claims recited procedure not directly connected with the article being worked upon. In Witherow vs. Donner, 31 Fed. (2nd) 157,175, the Court held the following claim valid and infringed:

"2. In the method of die rolling, the steps consisting in passing leaders between normally rotating die rolls having matrix portions which vary in cross sectional size or shape to produce a plurality of articles which are of different cross sectional size or shape at different points, continuing the operation until the rolls have become roughened at the matrix portions thereof, stopping the rotation of the rolls, and polishing the roughened portions of the rolls by guiding a polishing tool over such roughened portions while the rolls are inoperative."

For the foregoing reasons, therefore, it is respectfully submitted that method Claims 2 to 10 are proper method claims and should be allowed, since the Ferris patent does not disclose the procedure claimed. The favorable action of the Examiner is respectfully solicited.

Respectfully submitted,

TOULMIN & TOULMIN
Attorneys for Applicant.

Dayton, Ohio,
April 1, 1938.

216 Endorsed: Mailed May 12 1938

Div. 14 Room 5097 (Manian) Paper No. 5

Department of Commerce
United States Patent Office

May 12, 1938

Applicant: Walter Ernst
Ser. No. 154,365
Filed 7-19-1937
For Method of Drawing Metal Articles

Toulmin & Toulmin
Mutual Home Building
Dayton, Ohio

This action is responsive to the amendment filed April 4, 1938.

Claims 2 through 10 are again rejected on FERRIS for the reasons of record. These claims are directed to the method of drawing metal in which the blank is clamped hydraulically with different pressures at different locations around its periphery. This is clearly shown in the reference. Applicant depends for patentability of these claims on limitations reciting the source or manner in which the clamping pressures are developed. It is held that, in the method of drawing metal, it matters not how the pressures are developed, whether it be developed in the manner shown by FERRIS, by the machines of the present disclosure, or by individual pumps or pressure sources for each clamping cylinder. The method of drawing metal is the same regardless of the source of pressure fluid. Applicant's statement that many different types of machines could be employed to carry out the function recited in the claims, is true since he himself discloses more than one machine. This rejection is based on the ground that the source or manner of developing the clamping pressures is not a material and patentable limitation in the method of drawing metal.

G. A. SMITH,
Examiner.

217 Endorsed: Mail Division U. S. Patent Office Nov 10 1938

Endorsed: U. S. Patent Office Nov 12 1938 Division 14

United States Patent Office

Div. 14, Room 5097

In the application of Walter Ernst, Ser. No. 154,365, Filed July 19, 1937, For Method of Drawing Articles.

Hon. Commissioner of Patents,
Washington, D. C.

Sir:

In response to the Official action of May 12, 1938:

Please cancel Claims 2, 3, 8, 9 and 10.

In Claims 4 to 7, inclusive, line 1, cancel "drawing" and substitute—generating and utilizing hydraulic power for clamping—; after "articles", insert—being drawn—; line 2, after "article", insert—by hydraulic means—; and cancel "hydraulically".

In Claim 4, line 6; and Claims 5, 6 and 7, line 5, after "force", insert—to move the hydraulic clamping means relatively to the clamped article during the drawing action so as—.

218 *Remarks*

The present amendment is made as a result of an oral interview with the Principal Examiner in charge of this application. The amendments herein made were discussed only as to their general nature, and not specifically, because of the absence of the Assistant Examiner on leave, and because of the desire of the Principal Examiner to have the Assistant Examiner consider the amended claims before rendering any decision as to their patentability.

The claims are cancelled, not by reason of the art, but because the remaining claims cover the principal features of the invention, and because it is desired to reduce the number of issues in the case and concentrate the further prosecution of the application upon but a few issues.

Reconsideration is respectfully asked for Claims 4 to 7, inclusive, over their rejection on Ferris. These claims have been amended so that they are no longer directed to a method of drawing articles but are now directed to a method of generating and utilizing hydraulic power for clamping articles being drawn. The claims recite clamping the article by hydraulic means, applying a drawing force to the article while so clamped, utilizing a portion of the drawing force to move the hydraulic clamping means relatively to the
clamped article during the drawing action so as to
219 generate pressure fluid during the drawing operation, and applying the pressure fluid so generated to assist the clamping action.

Claim 7 goes into still further detail by specifying utilizing a portion of the retracting force to generate pressure fluid, and applying the pressure fluid thus generated to maintain the clamping pressure during retraction.

The method set forth in these steps is not found in Ferris, and cannot be practiced by the apparatus shown by Ferris. Ferris uses an external source of pressure fluid for actuating his clamping plungers, and does not generate pressure fluid by utilizing a portion of the drawing force, as now specified. Furthermore, he does not apply the pressure fluid thus generated to assist the clamping action, but depends entirely upon his external source of pressure fluid for clamping the workpiece. With the revised language of the claims placing the emphasis of the invention upon the method of generating and utilizing hydraulic power for clamping the articles, it is respectfully submitted that the claims now patentably differentiate over Ferris, particularly when considered in the light of the method steps recited above.

For these reasons and since the claims no longer recite a method of drawing metal, it is further submitted that
the objections of the Examiner are no longer per-
220 tinent, and that the few claims retained should be

allowed. The favorable action of the Examiner is respectfully solicited.

Respectfully submitted,

TOULMIN & TOULMIN,
Attorneys for Applicant.

Dayton, Ohio,
Nov. 8, 1938.

221 Endorsed: Mailed Dec 13 1938

Div. 14 Room 5097 (Manian) Paper No. 7

Department of Commerce
United States Patent Office
Washington

December 13, 1938

Applicant: Walter Ernst
Ser. No. 154,365
Filed 7-19-1937
For Method of Drawing Metal Articles

Toulmin and Toulmin
Mutual Home Building
Dayton, Ohio

This action is responsive to the amendment filed November 10, 1938.

The insert added to claim 4, line 6, and in line 5 of claims 5, 6, and 7, is misleading, inaccurate and not readable on the instant disclosure. The hydraulic clamping means is not moved relatively to the clamped article during the drawing action as recited by the statement in this insert. The clamping means 44 engages the blank before there is any drawing action, and there is practically no further movement of the clamping means thereafter. Claims 4 through 7 are accordingly rejected as misleading, inaccurate and not readable on the instant disclosure for the reasons given above.

Claims 4 through 7 are further and again rejected on FERRIS for the reasons fully given in the last Official action. These claims have been amended to recite additional functions of a machine. It is held that functional limitations will not render method claims patentable over the FERRIS disclosure.

Claims 4 through 7 are further rejected as setting forth the function or mode of operation of an apparatus. These claims are to a method. The steps in a method should be limited to acts for producing something. They should not be limited to a function or mode of operation of a machine.

B. YUNG KWAI
Acting Examiner.

222 Endorsed: Mail Division June 12 1939 U. S. Patent Office

Endorsed: U. S. Patent Office June 13 1939 Division 4.

United States Patent Office

Div. 14, Room 5097.

In the application of Walter Ernst,
Ser. No. 154,365,
Filed July 19, 1937,
For Method of Drawing Metal Articles.

Hon. Commissioner of Patents,
Washington, D. C.

Sir:

In response to the Official action of December 13, 1938:

Please cancel Claim 6.

In Claim 4, line 6; and Claims 5 and 7, line 5, after "force", cancel the previous insertion.

In Claims 4, 5 and 7, line 5, cancel "utilizing" and substitute —diverting—.

In Claim 5, line 3, change "location" to —locations—.

In Claim 7, lines 9 and 10, cancel "utilizing" and substitute —diverting—.

223 *Remarks*

Claim 6 is cancelled, not by reason of the art but because the remaining claims cover the principal features of the invention.

Reconsideration is respectfully asked for Claims 4, 5 and 7 over their rejection as inaccurate. The insertion objected to has been deleted by the present amendment.

Reconsideration is respectfully asked for Claims 4, 5 and 7 over their rejection upon Ferris. These claims, as amended, now specify clamping the article by hydraulic means, applying a drawing force to the article while so clamped, diverting a portion of the drawing force to generate pressure fluid during the drawing operation, and applying the pressure fluid so generated to assist the clamping action.

This method cannot be practiced by the apparatus of Ferris, who does not generate pressure fluid by diverting a portion of the drawing force, and applying this pressure fluid, so generated, to assist the clamping action. Ferris uses an external source of pressure fluid for clamping the workpiece. It is not seen, therefore, that the distinctions relied upon are merely functional distinctions but are steps in a new and useful process of generating and utilizing hydraulic power.

224 Reconsideration is respectfully asked for Claims 4, 5 and 7 over their rejection as setting forth the function or mode of operation of a machine. It is well settled that a method which may be practiced by different types of machines than the disclosed type, or by hand, cannot be said to be directed to the mere function of a machine. The applicant respectfully submits that the article, if of a thin sheet of material, might be drawn by hand and a portion of the drawing force diverted to generate pressure fluid by hand for assisting the clamping action. The use of power-driven machinery is, therefore, not indispensible except for heavy materials. It is again to be emphasized that the method as now stated is not a method of drawing ar-

ticles but rather a method of generating and utilizing hydraulic power.

Since the method can be practiced by various machines, or by hand, it is therefore believed to be patentable. The cases supporting this contention are quoted in the amendment filed April 4, 1938, on pages 2 and 3. These cases apply even more emphatically to the claims as they are now worded than to the claims in their previous condition. The steps in the present method, moreover, are limited to acts for producing something, namely, for generating hydraulic power in an auxiliary manner to the main power being employed.

225 For the foregoing reasons, therefore, the applicant submits that the three claims now remaining in the case are patentable over the references and should be allowed. The favorable action of the Examiner is respectfully solicited.

Respectfully submitted,
TOULMIN & TOULMIN
Attorneys for Applicant.

Dayton, Ohio,
June 9, 1939.

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226 Endorsed: Mailed Jul 28 1939

Submitted Jul 26 1939 Supervisory Examiner

Div. 14. Room 5097 (Manian) Paper No. 9.

Department of Commerce
United States Patent Office
Washington

Applicant: Walter Ernst
Ser. No. 154,365
Filed 7-19-1937
For Method of Drawing Metal Articles

Toulmin and Toulmin
Mutual Home Building
Dayton, Ohio

This action is responsive to the amendment filed June 12, 1939.

The objection to the drawings made in the first Official action is repeated.

Claims 4, 5, and 7 are again rejected on FERRIS. These claims are held to be met in terms by the reference. Applying the reference to claim 4, by way of example, the blank is clamped by the clamp 30 by hydraulic means at its periphery with different pressures at different locations therearound (page 4, lines 1 to 12). Drawing force is applied to the blank while so clamped. This force in the reference consists of the pump 42, the member 15, and all the connections therebetween. A portion of the drawing force coming from the pump 42 is diverted and applied to assist the clamping action (page 4, lines 108-111). The limitation in the last four lines of claim 4 is accordingly fully met by the reference.

This action is hereby made FINAL.

E. L. REYNOLDS
Examiner.

227 Endorsed: U. S. Patent Office Division 14 Nov 3 1939

Mail Division U. S. Patent Office Nov-1 1939

Toulmin & Toulmin
Attorneys at Law
Patent and Corporation Law
Dayton, Ohio

October 31, 1939

Hon. Commissioner of Patents,
Washington, D. C.
Sir:

Re: Ernst Application Ser. No. 154,365, filed July 19, 1937.

Enclosed find an appeal to the Board of Appeals in the above application. Please file the same and advise us as to the date of hearing.

A check for $15.00, to cover the appeal fee, is enclosed herewith.

Respectfully,

TOULMIN & TOULMIN

228 Endorsed: Mail Division U. S. Patent Office Nov 1 1939

Nov-1-39 083444 B "Check"—15.00

U. S. Patent Office Division 14 Nov 3 1939

Board of Appeals U. S. Patent Office Nov 2-1939

United States Patent Office

Div. 14, Room 5097.

Application of Walter Ernst, Ser. No. 154,365, Filed August 19, 1937, For Method of Drawing Metal Articles.

Appeal to Board of Appeals.

Appeal is hereby taken to the Board of Appeals from the decision of the Primary Examiner, dated July 28, 1939, finally rejecting claims 4, 5 and 7. The grounds for appeal are as follows:

1. The Primary Examiner erred in finally rejecting the claims.
2. The Primary Examiner erred in not allowing the claims.
3. The Primary Examiner erred in not holding the claims patentable over the references cited by him.
4. The Primary Examiner erred in holding that the limitation in the last four lines of claim 4 is met by the reference relied upon by him.

An oral hearing is requested.

The appeal fee of $15.00 is sent herewith.

Respectfully,

TOULMIN & TOULMIN
Attorneys for Ernst.

Dayton, Ohio,
October 30, 1939.

229 Endorsed: Mailed Nov 21 1939

Division 14 (Room 5097) M/NS Paper No. 11

Department of Commerce
United States Patent Office

Washington, D. C.
Nov 21 1939

Before the Board of Appeals on appeal from the Primary Examiner, Div. 14.

In re Application of Walter Ernst Serial No. 154,365 Filed July 19, 1937 For: Method of Drawing Metal Articles.

Attorney: Toulmin & Toulmin,
Mutual Home Bldg.,
Dayton, Ohio.

Examiner's Statement

This is an appeal from the final rejection by the Primary Examiner of claims 4, 5 and 7 constituting all the claims in this application.

The appealed claims are:

4. A method of generating and utilizing hydraulic power for clamping articles being drawn comprising clamping the article by hydraulic means at its periphery with different pressures at different locations therearound, applying a drawing force to the article while so clamped, diverting a portion of the drawing force to generate pressure fluid during the drawing operation, and applying the pressure fluid so generated to assist the clamping action.

5. A method of generating and utilizing hydraulic power for clamping articles being drawn comprising clamping the article by hydraulic means at its periphery with different pressures at different locations therearound, applying a drawing force to the article while so clamped, diverting a portion of the drawing force to generate pressure fluid during the drawing operation, applying the pressure fluid so generated to assist the clamping action, and discharging the

excess pressure fluid when the pressure thereof reaches a predetermined maximum.

7. A method of generating and utilizing hydraulic power for clamping articles being drawn comprising clamping the article by hydraulic means at its periphery with different pressures at different locations therearound, applying a drawing force to the article while so clamped, diverting a portion of the drawing force to generate pressure fluid during the drawing operation, applying the pressure fluid so generated to assist the clamping action, applying a retracting force to the member applying the drawing force, diverting a portion of the retracting force to generate pressure fluid, and applying the pressure fluid thus generated to maintain the clamping pressure during retraction.

The reference relied upon is:

Ferris 1,970,134 Aug. 14, 1934.

The alleged invention is directed to the process of drawing sheet metal. Referring to Fig. 1 of the drawing a blank sheet of metal is placed on the lower stationary die 15. The drawing plunger 41 is secured to or integral with a main platen 36 actuated by the double-acting piston 23 in the cylinder 20. A blank holder 44 has a plurality (4) of pistons 38 receivable in the cylinders 37 formed in the main platen. The cylinders 37 are connected to the return side of the main piston 23 by means of the passage 47. Check valves 46 (4) individual to each cylinder 37 permit fluid to pass from the lower side of the cylinder 20 to each of the clamping cylinders and prevent a reverse flow. Each clamping cylinder 37 is provided with an adjustable pressure relief valve 51, which permit varying pressures in the clamping cylinders. In operation fluid pressure is directed from the pump 30 to the upper side of the piston 23 to move the same and the platen 36 downwardly, carrying with them the clamping member 44. The clamping member 44 stops when it engages the blank that was placed on the lower stationary die. As the platen 36 continues its downward move-

ment pressure builds up in the individual clamping cylinders (due to the exhaust from the lower side of the piston 23 into the cylinders 37, and also to the relative movement of the pistons 38 and cylinders 37) until the pressure is reached in each cylinder for which its respective pressure relief valve has been set. By varying the settings of these valves, the pressures in the cylinders 37 will differ
231 thereby providing different clamping pressures around the blank. The drawing plunger 41 continues its downward movement and performs its drawing operation on the blank. The transmission of a part of the force applied to the piston 23, to the clamping pistons is defined in the claims as "diverting a portion of the drawing force to generate pressure fluid—to assist the clamping action."

Claims 4, 5 and 7 have been finally rejected on the patent to Ferris. In Ferris the member 15 is the main plunger and the sylphons 31 (see Figs. 1, 2, 3 and 5) are the clamping cylinders actuating the clamp 30. Each sylphon has its individual pressure relief valve 110 to permit varying clamping pressures to be applied around the periphery of the blank.

Claim 5 is believed to be representative of the appealed claims, and will be applied to the reference. The first step recited in this claim consists in clamping the article by hydraulic means at its periphery with different pressures at different locations therearound. This is accomplished in the reference by the sylphons 30 located around the blank, the pressures in the sylphons being different as described on page 4, lines 1-12. The next step consists in applying a drawing force to the blanks so clamped. The drawing force in the reference consists of the pump 42, the member 15 and all the connections therebetween. The third step consists in diverting a portion of the drawing force "to generate pressure fluid during the drawing operation, and applying the pressure fluid so generated to assist the clamping action." The language in this step is somewhat misleading since (pressure) fluid is not generated. The structure in the instant case merely transmits some of the force applied to

the piston 23 to the clamping pistons 38 through the
232 fluid medium. No fluid is generated. No force is
generated since the force is originally in the piston 23 as it is moved by the pressure applied at the top thereof. With this explanation, the third step so far as it is readable on the instant disclosure, is equally readable on Ferris. In Ferris a portion of the drawing force coming from the pump 42 is diverted and applied to assist the clamping action—see page 4, lines 101-111, and particularly lines 108-111. The final step consists in discharging the excess pressure fluid (from the clamping cylinders) when the pressure thereof reaches a predetermined maximum. This step is present in Ferris since the pressure relief valves 110 will discharge excess pressure fluid in their respective cylinders. It is submitted that claim 5 is unpatentable over Ferris.

Claim 4 is broader than claim 5 in that it omits the last step. Claim 4 is therefore unpatentable over Ferris for the same reason.

Claim 7 includes two "generating pressure fluid" steps for the clamping operation, one due to the exhaust of the fluid from the lower side of the piston 23 into the clamping cylinders, and the other due to the relative movement between the piston 38 and the cylinder 37. Since there is no real "generation of pressure fluid" in the instant case as explained above, it is submitted that claim 7 is unpatentable over Ferris for the same reason.

In conclusion it is desired to point out that the claims on appeal are directed to the method of drawing metal. The fundamental idea in the method of drawing is to clamp the blank by hydraulic means at its periphery with different pressures at different locations therearound. This is fully disclosed and described in the reference (page 4,
233 lines 1-12). In both cases the fluid pressure in each
of the clamping cylinders is controlled and regulated by a pressure relief valve. The immediate source of pressure applied in the clamping cylinders is slightly different in the two cases. In Ferris the source is direct from the pump, and in the instant case the source is from the pump

and through the main drawing piston. In the first place, and as indicated above, claims 4, 5 and 7 are so broad as not to reflect this difference. Secondly, if these claims are interpreted by reading into them the above noted difference, it is submitted that in the method of drawing sheet metal the immediate source of force for the clamping means is not critical and therefore not a patentable distinction.

For the foregoing reasons it is believed that the final rejection of claims 4, 5 and 7 is proper and should be affirmed.

Respectfully submitted,

H. B. FRUHOF
Acting Examiner, Div. 14.

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234 Paper No. 12 33,196

Department of Commerce
United States Patent Office
Washington

December 15, 1939

Sir:

The case of Walter Ernst, Serial No. 154,365, will be heard by the Board of Appeals on the 20th day of May, 1940.

The hearings will commence at 9.30 A. M. and as soon as the argument in one case is concluded the succeeding case will be taken up.

If any party, or his attorney, shall not appear when the case is called, his right to an oral hearing will be regarded as waived.

The time allowed for arguments is as follows:

Ex parte cases, thirty minutes;

Inter partes appeals: Interlocutory and final hearings when no testimony has been taken, thirty minutes each side; final hearing when testimony has been taken, one hour each side.

By special leave, obtained before the argument is commenced, the time may be extended.

The appellant shall have the right to open and conclude in inter partes cases, and in such cases a full and fair opening must be made.

Briefs in inter partes appeals must be filed in accordance with the provisions of Rules 144 and 163, as amended.

Respectfully,

CONWAY P. COE
Commissioner of Patents.

To Messrs. Toulmin & Toulmin
Mutual Home Bldg.
Dayton, Ohio.

235 Board of Appeals U. S. Patent Office May 20 1940

Appeal No. 33,196 Paper No. 13 Brief

United States Patent Office

Application of Walter Ernst,

Ser. No. 154,365,

Filed July 19, 1937,

For Method of Drawing Metal Particles.

Before Board of Appeals on Appeal

Applicant's Brief

This is an appeal to the Board of Appeals from the final rejection of claims 4, 5 and 7 by the Primary Examiner.

Invention

In this case applicant has devised an improved and simplified method of utilizing hydraulic power in the drawing of articles wherein the work piece is clamped at its periphery at a plurality of places while the drawing force is applied to draw the work piece into the desired shape to form the article. The method of drawing metal articles is broadly not new but applicant is the first to provide an improved

method of utilizing hydraulic power whereby a portion of the drawing force is utilized to provide hydraulic fluid pressure to clamp the article being drawn at its pe-
236 riphery during the drawing operation. As set out in the specification on page 1 the object of this invention

"* * * is to provide a method of drawing articles, wherein the piece of material or blank is clamped near its periphery at a plurality of clamping points, at different locations thereon, while the drawing force is applied to the article, then generating *clamping fluid pressure by the action of the drawing force and applying a portion of the pressure fluid so generated to assist the drawing action.*"

The main feature as italicized comprises utilizing a portion of the drawing force to hydraulically clamp the article while it is being drawn.

Reference Relied Upon by the Examiner

Ferris 1,970,134 August 14, 1934

The patent to Ferris is the only reference which the Examiner finds pertinent to the claims on appeal, and, as will be pointed out, this patent does not anticipate the method as defined by the claims on appeal.

Claims on Appeal

The claims read as follows:

"4. A method of generating and utilizing hydraulic power for clamping articles being drawn comprising clamping the article by hydraulic means at its periphery with different pressures at different locations therearound, applying a drawing force to the article while so clamped, diverting a portion of the drawing force to generate pressure fluid during the drawing operation, and applying the pressure fluid so generated to assist the clamping action.

237 "5. A method of generating and utilizing hydraulic power for clamping articles being drawn comprising

clamping the article by hydraulic means at its periphery with different pressures at different locations therearound, applying a drawing force to the article while so clamped, diverting a portion of the drawing force to generate presure fluid during the drawing operation, applying the pressure fluid so generated to assist the clamping action, and discharging the excess pressure fluid when the pressure thereof reaches a predetermined maximum.

"7. A method of generating and utilizing hydraulic power for clamping articles being drawn comprising clamping the article by hydraulic means at its periphery with different pressures at different locations therearound, applying a drawing force to the article while so clamped, diverting a portion of the drawing force to generate pressure fluid during the drawing operation, applying the pressure fluid so generated to assist the clamping action, applying a retracting force to the member applying the drawing force, diverting a portion of the retracting force to generate pressure fluid, and applying the pressure fluid thus generated to maintain the clamping pressure during retraction."

Applicant's method of utilizing hydraulic power by drawing articles may be more clearly described by referring to the operation of a metal drawing press as illustrated in Figure 1. In the operation of this form of press the pump 30 is started and the valve 28 is turned so that the fluid pumped from the surge tank 19 is forced through the pipe line 26 into the upper chamber of the cylinder 20 to remove downward the piston 23. The fluid pressure forces the drawing plunger 22 and platen 36 downwardly, carrying with them the clamping member 44. When the clamping member engages the periphery of the work piece
238 16, which is to be withdrawn, the clamping member
is arrested, but the platen 36 carrying the drawing punch member 41 continues to move downwardly forcing the drawing die or punch 41 into engagement with the work piece 16 to draw the same into the desired shape. As the drawing member 41 moves downwardly it forces the cen-

tral portion of the work piece 16 into the die cavity 15 and overcomes the resistance of the supporting plunger 17, which protects the tip of the work piece 16.

During this operation fluid pressure has been built up in the clamping cylinders 37 by reason of the relative motion between the platen 36 and the clamping plungers 38 supporting the clamping member 44 and the fluid in the clamping cylinders 37 has been prevented from escaping outward through line 45 by the closing of the outwardly opening check valves 46. When the pressure within each of the clamping cylinders 37 reaches the amount for which each of their relief valves 51 is set, the latter opens and discharges fluid through the line 53 into the return line 52 and back to the surge tank reservoir 19. In this manner each clamping plunger 38 is caused to exert a different force upon the portion of the work piece periphery which is engaged by the clamping member 44. The downward movement of the platen 36 during the drawing operation is utilized to apply hydraulic pressure to the clamping plungers 38, thus diverting a portion of the drawing force to
239 generate hydraulic pressure to assist the clamping
action and permitting the discharging of the excess pressure fluid through the relief valves 51 when the maximum pressure at which they are set to operate is reached.

When the drawing stroke of the press has been completed the setting of the four-way valve 28 is reversed so that the fluid under pressure flows through the line 27 into the cylinder on the other side of the piston head 23 bringing about the raising of the plunger 22 upwardly. A portion of the fluid under pressure, however, passes downwardly through the plunger passageway 47 and outwardly in the passageways 45 into the clamping cylinders 37 causing the plungers 38 to remain in position to clamp the work piece 16 while the punch or drawing die 41 is withdrawn from the work piece and die 14. Operation of the relief valves 51 is prevented during this operation by the pressure of the fluid in the line 56 which communicates with the passageway 47 within the drawing plunger 22.

During the pull-back or release stroke of the plunger 22
hydraulic fluid pressure is applied simultaneously on op-
posite sides of the valve plunger 62 within the relief valve
51, and prevents it from opening regardless of how low a
clamping pressure is provided by the setting of each of the
relief valves 51. When the platen 36 has moved up-
240 wardly along the rods 81 in retracting the drawing
die 41 from engagement with the work piece 16 the
member 36 will engage the bolt heads 83 and lift the clamping member 43 free of engagement of the work piece and enable the operator to remove the drawn article from the press.

In applicant's method the hydraulic fluid pressure which is used for clamping the work piece is generated by the relative movement of the clamping plungers 38 with respect to the platen 36 and there is no independent means used for supplying hydraulic fluid pressure to the clamping piston cylinders. This is not true in the method disclosed by the patent to Ferris.

Ferris Patent Disclosure

In the patent to Ferris a hydraulic press is disclosed
which is adapted to perform drawing operations for form-
ing articles from sheets or blanks. Provision is made for
applying different clamping pressures at different points
around the margin of the work piece, but there is no pro-
vision made whereby the main clamping pressure is gen-
erated by diverting a portion of the drawing force during
the drawing operation incident to moving the drawing die
and press parts together, to provide for clamping of the
work piece at its periphery.

241 In Ferris, the hydraulic press as shown in Fig-
ures 1 and 5, comprises a main hydraulic piston
operated member 17 for moving the platen 15 against the die 7 and auxiliary hydraulic operated pistons 24 for clamping the periphery of the work piece 16. Pistons 24 are adapted as described on page 2, lines 25 to 32 inclusive

"... to raise the pressure ring 22 and clamp the margin of the blank 16 between it and the lower face of the die 7, and the force or pressure exerted by any one of the rams 24 may be varied by varying the fluid pressure in its cylinder 25 to thereby apply different pressures upon different parts of the margin of the blank."

The patentee also states that

"In order to further vary the pressures upon different parts of the margin of the blanks and to apply a particular pressure upon any particular point thereof irrespective of the position of that point relative to the positions of the rams 24, the pressure ring may be provided with an annular channel 29, a cover plate or top plate 30 which covers the channel and normally rests upon the side walls thereof, and a plurality of sylphons 31 which may be arranged in selected positions in the channel 29 and supplied individually with pressure fluid to exert individual pressures upon different points around the margin of the blank." (Page 2, lines 33 to 45 inclusive)

Fluid pressure in each of the sylphons 31 is limited by adjustment of the resistance valve member 110 as shown in Figure 5. The Examiner particularly refers to the disclosure in Ferris on page 4, lines 108 to 111 inclusive, as anticipating applicant's method of diverting a portion of
the drawing force to provide for hydraulic pressure
242 clamping force. Applicant respectfully submits that
the disclosure of Ferris as set out on page 4, lines 108 to 111 inclusive, relative to passing a limited volume of liquid through the chokes 90 to create the desired pressure in the cylinders 28 and the sylphons 31 are not the equivalent of applicant's step of diverting a portion of the drawing force to apply the main hydraulic fluid pressure to the clamping means during the drawing operation. This follows because in applicant's case no independent flow of fluid is made to the cylinders 37 for operating the clamping member 44. Each of the claims includes this limitation and

it is submitted that applicant's claims patentably differentiate over the teachings of Ferris.

Referring further to the patent to Ferris it will be observed that it is necessary to generate pressure fluid continuously during the drawing operation in order to maintain the clamping means in position to properly hold the work piece in place. In applicant's method, however, the pressure is generated or provided for by utilizing the movement of the platen 36 relative to the piston means 38 of the clamping means 44. In other words, hydraulic fluid in the cylinders 37 is placed under pressure when the platen 36 is moved downwardly during the drawing operation.

On the contrary, in Ferris's method independent
243 clamping means is provided which comprises hydrau-
lic pressure operated pistons wherein fluid under
pressure is supplied to the cylinders to move the pistons and it is necessary to continue to supply the clamping fluid in order to maintain the clamping pressure. Sufficient fluid must be supplied to make up any loss due to leakage and also to provide for any distortion of the work piece that may allow the clamping plunger to move. In other words, in Ferris, the clamping pressure can only be maintained by continuously supplying clamping fluid to the cylinders operating the clamping pistons.

In applicant's method the clamping means moves toward the work with the main platen and the relative position of the two makes it unnecessary to supply fluid to the clamping cylinders in order to cause this movement. When contact with the work is made the clamping platen or ring stops and pressure is then generated by the clamping cylinders moving downwardly over the clamping plungers and pressure is not generated by any independent means as in the case of Ferris.

The method devised by applicant provides a decided improvement over that disclosed by Ferris, and some of the most important features may be enumerated as follows:

1. The advance of the clamping platen at the same time the main platen advances, and the fact that the punch or die is carried by the main platen is practically in
244 position to begin the drawing operation as soon as
the work is clamped, materially reduces the time necessary for a cycle, as compared with the method of operation disclosed by Ferris. In the reference the clamping step is performed first before the drawing die or punch can begin to advance.

2. Applicant's method of producing clamping pressure by relative movement of the main platen to the clamping platen means that there is only so much resistance to the advances of the main platen as is required to clamp the work. This may be considered as a loss of effective drawing pressure, however, if so it will be obvious that this method does not lower the efficiency of the method as much as in the case of Ferris. In the reference the pressure developed by the pump must be whatever is required to produce the drawing operation and this pressure, whatever it may be, is utilized in the clamping cylinders, and although this pressure does not resist the advance of the main platen the excess pressure above what may be required in clamping is wasted through the relief valves and therefore results in a reduction in efficiency of the press. To make this clear, as an example, the drawing operation might require the pressure of 2500 lbs. per square inch in the main cylinder, but for clamping purposes possibly only 500 lbs. pres-
245 sure per square inch on one or more of the clamping
cylinders might be required. In such a case 2000 lbs. per square inch would be wasted through the relief valves in the method as disclosed by Ferris.

3. In the Ferris method of operation the pump is required to supply hydraulic fluid to the clamping cylinders and excess pressure is released through the relief valves which means that there are several leakage orifices in the pump circuit. Since the flow through an orifice is proportional to the difference in head across the orifice, it will be

seen that in the example given above where there is a difference of 2000 lbs. per square inch across the orifice that there will be a very material leakage through it. This will result in a considerable wastage of pressure fluid and consequently a slowing up in press speed with resultant loss of efficiency and operation.

4. In applicant's method the work piece holder platen is returned to its position through mechanical means by the return movement of the main platen. As return movements are usually performed at low tonnage, a relative small return area is therefore all that is required and a corresponding high return speed is possible through directing
246 the entire pump displacement into a small return
cavity. This is not possible in the Ferris hydraulic press operation since the return movement is produced by directing the pump discharge into the five return cavities, one for the main operating piston and four for the work piece holder or clamp rams. For constructional reasons the return area must bear a certain minimum ratio to the main ram area; therefore, regardless of the pressure it is impossible to make the total return area on five plungers as small as it can be made on one. Accordingly it will be appreciated that it would be impossible to get as high return speed with the Ferris design as with applicant's, assuming that both use the same size of pump.

5. Another important factor which applicant's method provides over the reference is the provision for maintaining the clamping pressure until the main platen has returned a predetermined distance. This provides a method of stripping the work from the punch or drawing die in the event that the contour of the work piece is such that it has a tendency to stick on the drawing die. Nothing of this character is disclosed or suggested in the patent to Ferris. This is particularly brought out in claim 7 and it is submitted that a clear patentable distinction is made over Ferris.

247 The Examiner states that

> "to generate pressure fluid during the drawing operation, and applying the pressure fluid so generated to assist the clamping action."

is misleading since he considers that pressure fluid is not generated. In answer to this applicant proposes to revise the language of the claims as follows:—

Claim 4, change the last four lines to read—diverting a portion of the drawing force to generate hydraulic pressure during the drawing operation, and applying the pressure so generated to produce the clamping action.—.

In Claim 5, the last five lines would be changed to read—diverting a portion of the drawing force to generate hydraulic pressure during the drawing operation, and applying the pressure so generated to produce the clamping action and release the excess pressure at a predetermined maximum.—.

In Claim 7, it is proposed to revise the last seven lines to read—hydraulic pressure during the drawing operation, applying the pressure so generated to assist the clamping action, applying a retracting force to the member applying the drawing force, diverting a portion of the retracting force to generate pressure and applying the pressure thus generated to maintain the clamping pressure during retraction.—.

This rewording of the claims, if thought to be necessary by the Honorable Board of Appeals, will be made to recite the generation of hydraulic pressure rather than "pressure fluid". This, however, is not thought to be imperative since it is believed that those skilled in the art would readily understand that "pressure fluid" means hydraulic pressure. 248

The Examiner concedes that the Ferris reference does not fully meet the claims in stating that

". . . The immediate source of pressure applied in the clamping cylinders is slightly different in the two cases. In Ferris the source is direct from the pump, and in the instant case the source is from the pump and through the main drawing piston."

The important factor in applicant's method of applying the clamping source as a portion of the drawing source is one of the important distinctions and the Examiner merely states that the distinction is not a patentable one, but certainly in view of the prior art there is no justification for such a holding. Applicant here is a leader in the field of hydraulic power developing apparatuses and methods and it is submitted that the claims patentably distinguish over the prior art and are therefore clearly allowable to applicant.

Authorities

In support of the applicant's contention that the claims are clearly patentable to applicant the following decisions are made of record:

The Honorable Board of Appeals in ex parte Coberly, 8 U. S. Pat. Q. 239 (2nd syllabus).

The Honorable Board of Appeals in ex parte Lorenz, 11 U. S. Pat. Q. 105, page 107.

Witherow vs. Donner, 31 Fed. (2nd) 157, 175.

249 *Illustrative Drawing Exhibit*

To illustrate more clearly the different aspects of applicant's method of operation which patentably distinguish from the reference, there is attached to this brief a photostat drawing of applicant's hydraulic press structure, together with Ferris's. The corresponding operative parts have been similarly colored to render the method of operation more easily understood.

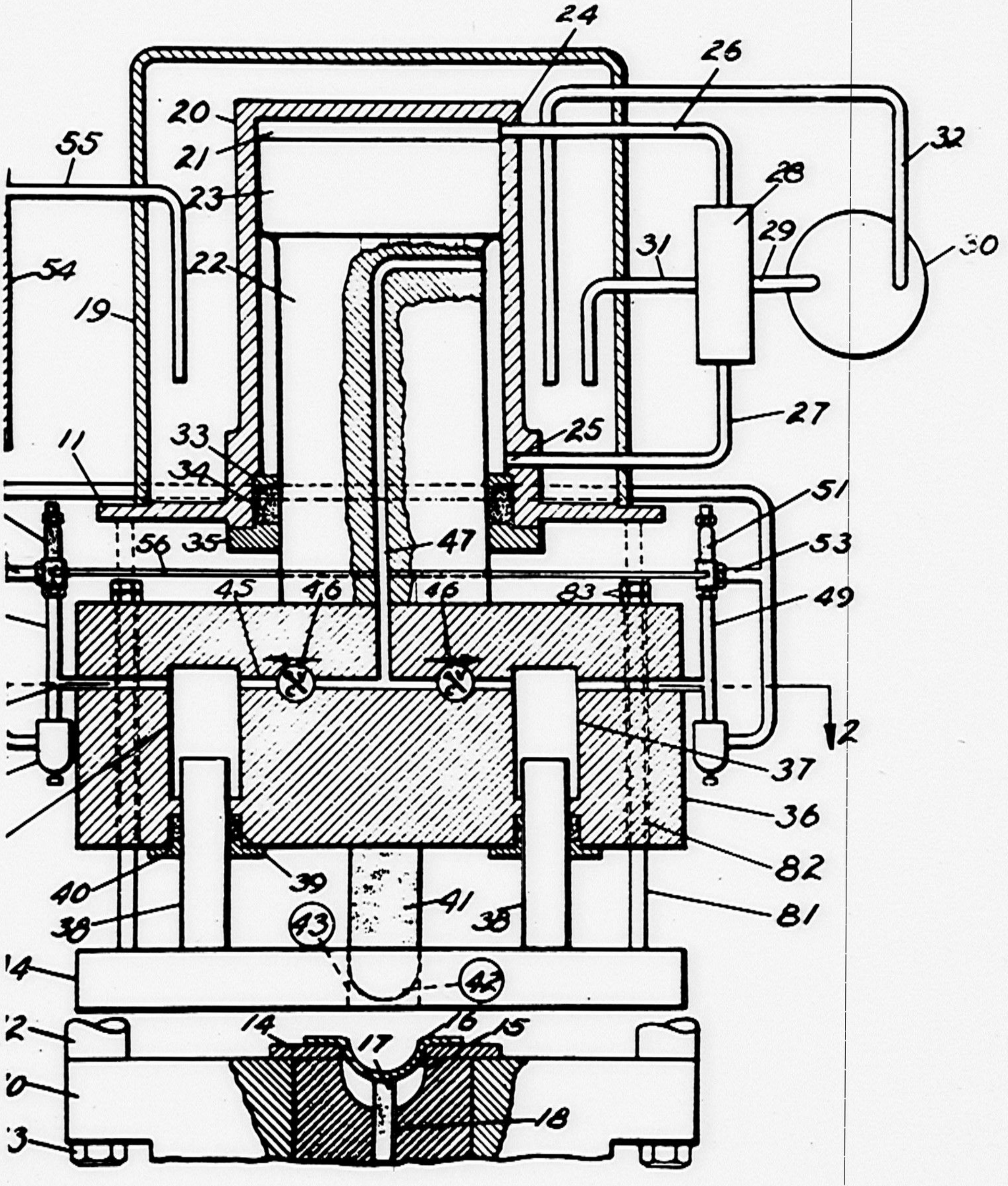
For the reasons explained, it is respectfully submitted that the rejection of claims 4, 5 and 7 was unwarranted and that the Examiner should be reversed.

Respectfully submitted,

TOULMIN & TOULMIN,
Attorneys for Applicant.

Dayton, Ohio.

APPLICANT'S APPARATUS
SERIAL # 154,365



Aug. 14, 1934. W FERRIS 1,970,134

HYDRAULIC PRESS

Filed July 29, 1932 3 Sheets-Sheet 1

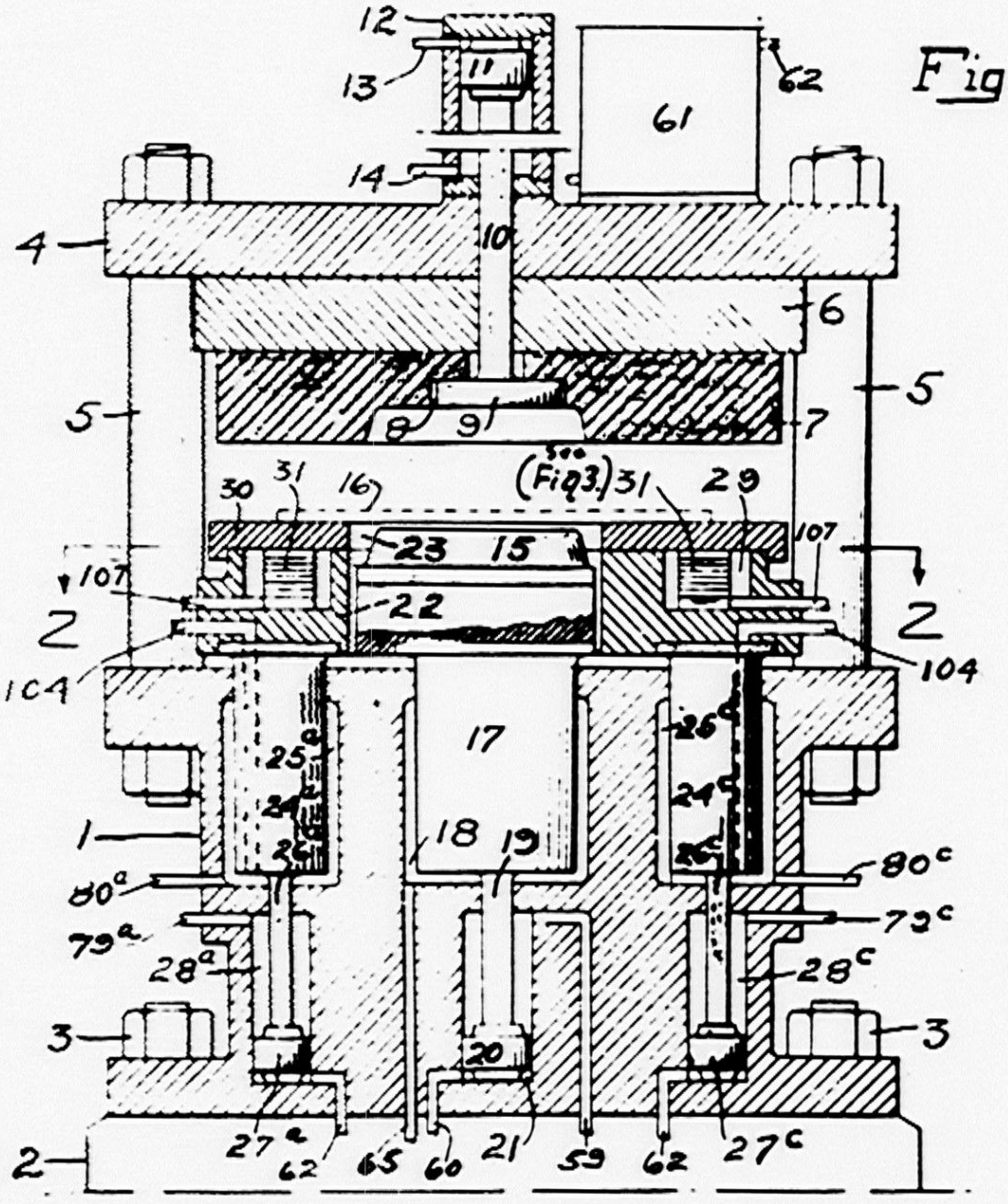


Fig. 1.

CONTINUED

Fig. 3.

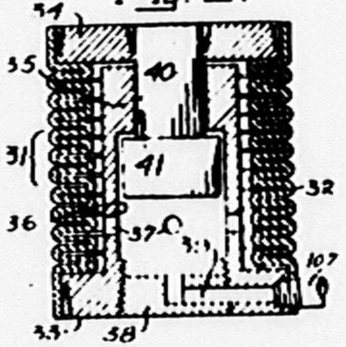


Fig. 4.

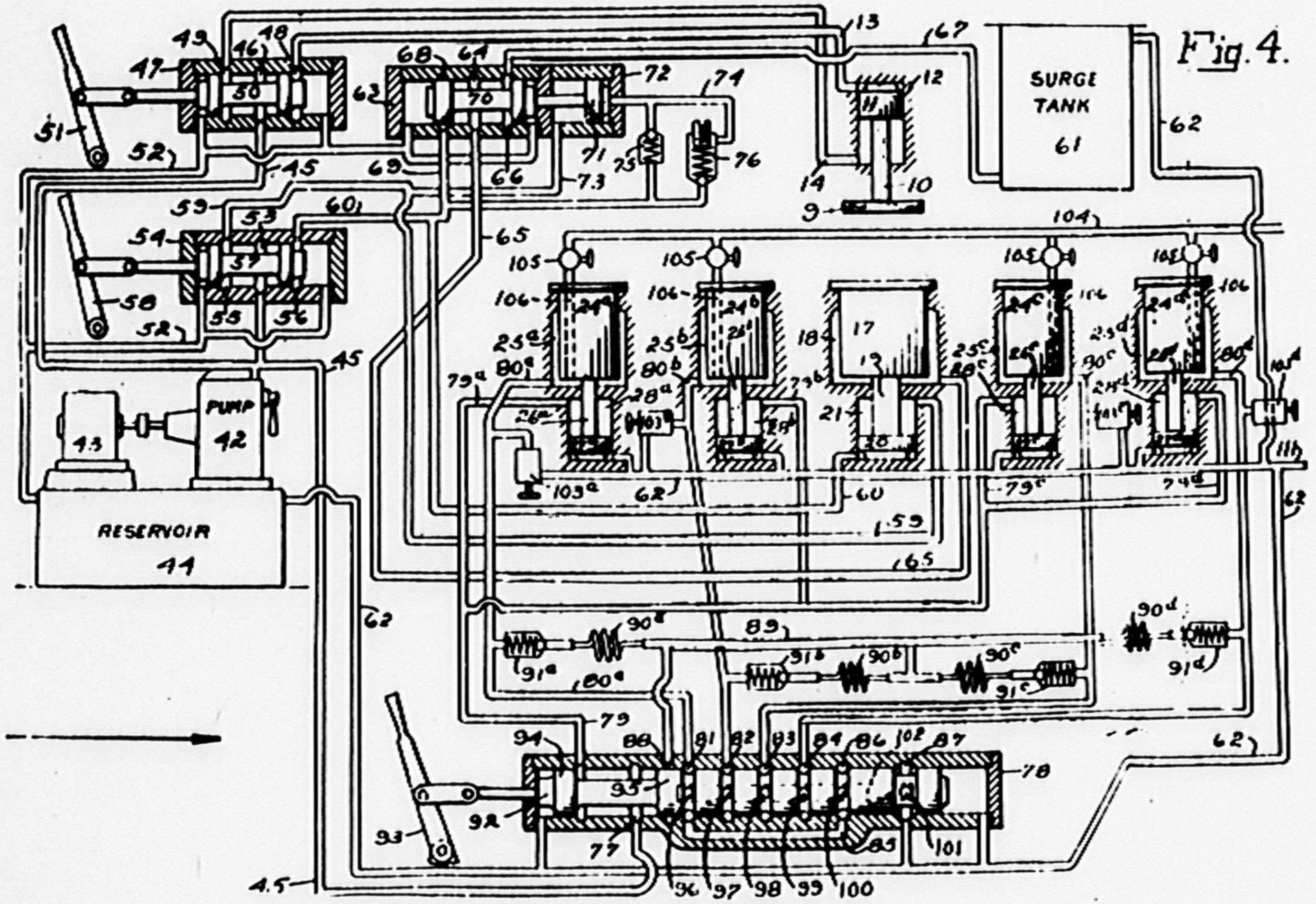
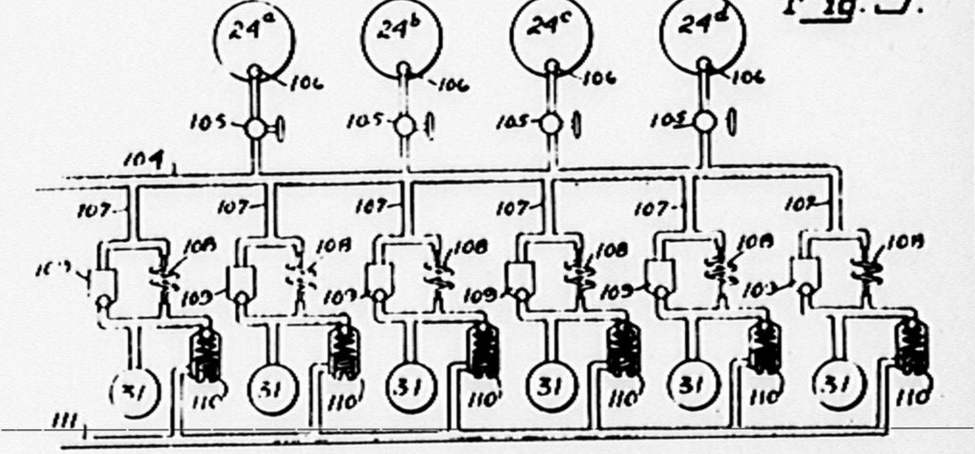


Fig. 5.



253 Endorsed: U. S. Patent Office Board of Appeals
Jun 12 1940 Mailed

Appeal No. 33,196 OB
Hearing:

In the United States Patent Office

Before the Board of Appeals

Ex parte Walter Ernst

Application for Patent filed July 19, 1937, Serial No. 154,365, a division of application No. 101,110 filed September 16, 1936. Method of Drawing Metal Articles.

Messrs. Toulmin & Toulmin for applicant.

This is an appeal from the action of the Primary Examiner finally rejecting claims 4, 5 and 7.

Claim 4 is illustrative and reads as follows:

> 4. A method of generating and utilizing hydraulic power for clamping articles being drawn comprising clamping the article by hydraulic means at its periphery with different pressures at different locations therearound, applying a drawing force to the article while so clamped, diverting a portion of the drawing force to generate pressure fluid during the drawing operation, and applying the pressure fluid so generated to assist the clamping action.

The reference relied upon is:

Ferris 1,970,134 Aug. 14, 1934

In the patent to Ferris, as in the application, the article to be drawn is clamped at its periphery with different pressures at different locations therearound. This is accomplished by the use of relief valves 103 and 110 which
254 are individually adjustable to permit the fluid
pressures to build up to the desired values at different locations, as are applicant's relief valves 51.

The pump 42 supplies fluid through the pipes 45, 80 and 104 to the several pressure applying means controlled by these valves. In the application, the pump 30 forces liquid into the cylinder 20 to elevate the piston 23, and also through the passage 47 to the cylinders 37 during retracting movement of the die plunger 41. The fluid is trapped in the cylinders 37 by the check valves 46, and during the next downward movement of the piston 23 and plunger 41 the trapped fluid causes the pistons 38 and the work clamping member to move downwardly and clamp the periphery of the work until the respective pressures determined by the relief valves 51 are established.

Applicant attempts to distinguish from the patent by stating that a diverted portion of the drawing force is utilized to generate the fluid pressure in the cylinders 37. While this pressure results from downward movement of the piston 21 and head 36, it is not transmitted through the drawing plunger 41. Claim 7 also states that fluid pressure is generated by a diverted portion of the retracting force and applied to maintain the clamping pressure during retraction. This pressure is created by fluid coming from the pump through the passages 27 and 47, the valves 51 at that time being held closed by pressure developed through the passages 56.

The references to diversion tend to confuse, rather than clarify. In any event, they refer to manipulative
255 steps of the apparatus which are without importance in defining the acts performed on the work. We are in full agreement with the examiner that in so far as the claims recite true methods they do not distinguish in any patentable respect from the reference.

We do not regard the changes in the claims proposed on page 13 of the brief, as affecting the merits, and in the event of appeal from this decision we approve entry of a proper amendment embodying these changes.

The decision of the examiner is affirmed.

EUGENE LANDERS,
Examiner-in-Chief.

F. EDINBURG,
Examiner-in-Chief.

J. W. CLIFT, JR.,
Examiner-in-Chief
Board of Appeals.

June 12, 1940
Messrs. Toulmin & Toulmin
Mutual Home Building
Dayton, Ohio

Endorsed: Mail Division Jul 17 1940 U. S.
256 Patent Office

Endorsed: U. S. Patent Office Jul 18 1940 Division 14

United States Patent Office

Application of
Walter Ernst,
Ser. No. 154,365, Div. 14,
Filed July 19, 1937, Room 5097.
For Method of Drawing
Metal Articles.
Hon. Commissioner of Patents,
Washington, D. C.

Sir:

Pursuant to the decision of the Board of Appeals of June 12, 1940, applicant amends the claims as follows:

Claim 4, line 6, after "generate", insert—hydraulic—and cancel "fluid"; line 7, cancel "fluid"; and line 8, change ‘‘assist’’ to —produce—, so that the last four lines will read —so clamped, diverting a portion of the drawing force to generate hydraulic pressure during the drawing operation, and applying the pressure so generated to produce the clamping action.—.

Claim 5, line 6, after ‘‘generate’’ insert —hydraulic—
and cancel ‘‘fluid’’; line 7, before ‘‘applying’’ insert
257 —and— and cancel ‘‘fluid’’; and line 8, change
‘‘assist’’ to —produce—, and cancel the comma
after ‘‘action’’ and change ‘‘discharging’’ to —relase—; line 9, cancel ‘‘fluid when the pressure thereof reaches’’; and line 10, insert —at— before ‘‘a’’, so that the last six lines will read —so clamped, diverting a portion of the drawing force to generate hydraulic pressure during the drawing operation, and applying the pressure so generated to produce the clamping action and release the excess pressure at a predetermined maximum.—.

Claim 7, line 6, insert —hydraulic— after ‘‘generate’’ and cancel ‘‘fluid’’; line 7, cancel ‘‘fluid’’; and line 11 cancel ‘‘fluid,’’ and ‘‘fluid,’ so that the last eight lines will read —to generate hydraulic pressure during the drawing operation, applying the pressure so generated to assist the clamping action, applying a retracting force to the member applying the drawing force, diverting a portion of the retracting force to generate pressure and applying the pressure thus generated to maintain the clamping pressure during retraction.—.

REMARKS

The Board of Appeals, in its decision of June 12, 1940, stated that applicant could amend the claims as above in the event of an appeal from its decision.

258 Applicant is preparing to file a complaint in the United States District Court for the District of Columbia and accordingly is filing the above amendment.

Respectfully,

TOULMIN & TOULMIN,
Attorneys for Applicant.

Dayton, Ohio.
July 15, 1940.

Address Only
259 The Commissioner of Patents
Washington, D. C.

Department of Commerce

United States Patent Office

Washington

Ex parte Walter Ernst,
Serial No. 154,365,
Filed July 19, 1937,
Method of Drawing Metal
Articles.

Notice of Civil Action Under Section 4915 R. S.

A civil action under Section 4915 R. S., entitled THE HYDRAULIC PRESS CORP., INC. and WALTER ERNST v. CONWAY P. COE, COMMISSIONER OF PATENTS, Civil Action No. 7743, involving this application, was filed on July 23, 1940, in the District Court of the United States for the District of Columbia.

W. W. COCHRAN,
Law Examiner.

July 23, 1940.

7/9/37

1937

CONTENTS

1. Application papers
2. prints (3) 7-23-37
3. Rej Oct 9 1927
Amdt A Apr 4 1938
5. Rej May 12 1938
Amdt B. Nov 10 1938
7. Rej Dec 13 1938
Amdt C June 2/39
9. Final Rej July 28 1939
10. Letter & Appeal Nov 1/39
11. Exrs Answer Nov 21/39
12. Hearing May 20 1940
13. BRIEF MAY 20 1940
DECISION BY BOARD JUN 12 1940
14.
15. Amdt D (not ent) July 17/40
6. Notice of Civil Action under Sec 4915 R.S. - July 23 - 1940
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42. File with rejected files
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46. 154365
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Deposition of Paul C. Pocock, taken before S. W. Froehle, a Notary Public in and for Montgomery County, Ohio, pursuant to the attached notice, and at the time and place therein mentioned, to wit, at the offices of Toulmin & Toulmin, 1120 Mutual Home Building, Dayton, Ohio, on Friday, September 12th, 1941, at ten o'clock (Eastern Standard Time), on behalf of the plaintiffs in the above entitled suit.

H. A. Toulmin, Jr., solicitor, present for plaintiffs; and no one present for defendant.

Thereupon Paul C. Pocock was duly sworn to testify the truth, the whole truth and nothing but the truth, and thereupon said Paul C. Pocock testified as follows in
93 answer to interrogatories propounded by H. A. Toulmin, Jr.

Paul C. Pocock

On direct examination

By H. A. Toulmin, Jr.:

Q. 1. Please state your name and address. A. My name is Paul C. Pocock and my residence is Marion, Ohio, but I receive mail care of The Hydraulic Press Mfg. Co., Mount Gilead, Ohio.

Q. 2. What is your occupation? A. I am Executive Vice-President of The Hydraulic Press Manufacturing Company, of Mount Gilead, Ohio.

Q. What are the nature of your duties with that Company? A. The duties that ordinarily go with a position of that kind. I oversee all sales and frequently visit prospects and make contacts with them to close sales. In this capacity I keep in close touch with all new developments being made by that company and also keep in close touch with all developments being made by The Hydraulic Press Corporation, Inc., one of the plaintiffs herein. I do this so I can present them to prospective customers.

I also do engineering work in connection with my employment with The Hydraulic Press Mfg. Co.

94 Q. 4. How long have you been keeping in touch with the inventions and developments of The Hydraulic Press Mfg. Co., and The Hydraulic Press Corporation, Inc.? A. I have been doing this since 1926 in connection with The Hydraulic Press Mfg. Co., and with The Hydraulic Press Corporation, Inc. since its formation in 1935, when it was incorporated.

Q. 5. Are you familiar with the invention of Walter Ernst covered by his application Ser. No. 154,365, filed in the United States Patent Office July 19, 1937, for a Method of Drawing Metal Articles, which application is involved in this suit. A. I am very familiar with that invention.

Q. 6. Has The Hydraulic Press Mfg. Co., of which you are Executive Vice-President, any connection with the invention of said Ernst application Ser. No. 154,365? A. Yes, The Hydraulic Press Mfg. Co. owns an exclusive license to practice the process set forth in said application.

Q. 7. Has The Hydraulic Press Mfg. Co. made and sold any presses which utilize the invention of said application Ser. No. 154,365? A. Yes.

Q. 8. Have these presses proved successful or un-
95 successful? A. They have proved very successful
and have been accepted by the trade over other presses.

Q. 9. To what is this success of such presses attributable? A. The invention of the Ernst application Ser. No. 154,365, herein. The presses which utilize the method of this invention have proven of great success due to the invention involved herein and have displaced prior presses which did not utilize this invention. This invention is a vital feature to the success of these presses and has increased the efficiency of the presses.

Q. 10. Can you produce any printed matter that illustrates or describes these presses? A. Yes.

Q. 11. Please produce the same. A. I produce this literature as follows:

Bulletin 3907.

"The Hydraulic Press" No. 20.

"The Hydraulic Press" No. 32, pages 1 to 7 inclusive, and

"The Hydraulic Press" No. 23, pages 2 and 3.

Q. 12. Can you produce a list of the sales by The Hydraulic Press Mfg. Co. of presses which practice the
96 invention involved in this suit? A. Yes.

Q. 13. Please do so. A. Here it is.

Q. 14. What does this list show? A. Under the heading "Customer" this list gives the names of the purchasers; under the heading "Address" its gives the locations of the purchasers; under the heading "Serial No." it gives the Serial Numbers of the presses sold; and under the heading "Year Ordered" it gives the years in which the presses were ordered.

Q. 15. Do all of the presses set forth on this list practice the invention involved herein? A. Yes.

Q. 16. How many presses are designated on this list? A. Forty-four.

Q. 17. Are these presses known by any name? A. Yes.

Q. 18. What is this name? A. H-P-M-Fastraverse Blankholder Presses and are used for deep metal drawing.

Q. 19. Can you state the total selling price for the forty-four presses set forth on the list which you have pro-
97 duced? A. Yes.

Q. 20. What is the total? A. $770,664.60.

Q. 21. How do you know that these presses sold for the price you have stated? A. I was familiar with the negotiations for the sale for these presses and the selling prices given in this list of contracts totalling to this amount. Even without the contracts I know the total is substantially that given.

Counsel for plaintiffs offer in evidence the following exhibits:

Plaintiffs Exhibit 1, (Bulletin 3907)

Plaintiffs Exhibit 2 ("The Hydraulic Press" No. 20)

Plaintiffs Exhibit 3 ("The Hydraulic Press" No. 32, pages 1 to 7 inclusive)

Plaintiffs Exhibit 4 ("The Hydraulic Press" No. 23, pages 2 and 3)

Plaintiffs Exhibit 5 (List of sales of hydraulic presses utilizing invention involved herein).

Plaintiffs Exhibit 6 (Ferris patent 1,970,134)

Plaintiffs Exhibit 7 (File wrapper Ser. No. 154,365)

PAUL C. POCOCK.

98 *Certificate*

STATE OF OHIO,
Montgomery County, ss:

I, S. W. Froehle, a Notary Public in and for Montgomery County, Ohio, hereby certify that the foregoing deposition by Paul C. Pocock was taken on behalf of the plaintiffs herein in pursuance of the notice hereto attached, before me, at the offices of Toulmin & Toulmin, 1120 Mutual Home Building, Dayton, Ohio, in said county, on the 12th day of September, 1941; and that said witness was duly sworn by me before the commencement of his testimony to testify the truth, the whole truth and nothing but the truth; that the testimony of said witness was taken by me directly on the typewriter; that plaintiffs were represented by H. A. Toulmin Jr., as counsel during the taking of said deposition, but no one appeared on behalf of the defendant; that said testimony was taken at the offices of Toulmin & Toulmin, 1120 Mutual Home Building, Dayton, Ohio, as above stated, and was commenced at 10:00 o'clock Eastern Standard Time on Friday, September 12th, 1941, and was concluded on the same day; that the witness read his deposition in my presence before he signed the same, and that he signed the same in my presence; that I marked the exhibits; and that I am not connected by blood or marriage with either of said parties, nor interested directly or indirectly in the matter in controversy.

99 My commission expires May 12, 1944.

In Testimony Whereof I have hereunto set my hand and notarial seal at Dayton, Ohio, in said county, this 15th day of September, 1941.

S. W. FROEHLE,
Notary Public in and for
(Seal) *Montgomery County, Ohio*

* * * * * * * * * *

164 *Plaintiffs' Exhibit No. 5*

Endorsed: District Court of United States, District of Columbia Civil Action 7743. The Hydraulic Press Corp. Inc. vs. Conway P. Coe, Commissioner of Patents. Plaintiffs' Exhibit No. 5. S. W. Froehle, Notary Public, Montgomery County, Ohio.

H-P-M Fastraverse Blankholder Presses for
Deep Metal Drawing

Installed in the Plants of:

Customer	Address	Serial No.	Year Ordered
Acklin Stamping Co.,	Toledo, Ohio	21843	1937
American Stove Co.,	St. Louis, Mo.	22198	1939
Amtorg Trading Corp.,	New York, N. Y.	21909	1938
Avancini & Cia.,	Buenos Aires, Argentina	21996	1938
Bailey Meter Co.,	Cleveland, Ohio	21615	1936
Benjamin Electric Co.,	Des Plaines, Ill.	22464	1940
Burroughs Adding Machine Company,	Detroit, Michigan	21502	1936
Corcoran Brown Lamp Co.,	Cincinnati, Ohio	21394	1936
Corcoran Brown Lamp Co.,	Cincinnati, Ohio	21395	1936
Corcoran Brown Lamp Co.,	Cincinnati, Ohio	21434	1936
Corcoran Brown Lamp Co.,	Cincinnati, Ohio	21435	1936
Corcoran Brown Lamp Co.,	Cincinnati, Ohio	21436	1936
Corcoran Brown Lamp Co,.	Cincinnati, Ohio	21437	1936
Corcoran Brown Lamp Co.,	Cincinnati, Ohio	21438	1936
Douglas Aircraft Co.,	Santa Monica, Calif.	22152	1939
Douglas Aircraft Co.,	Santa Monica, Calif.	22290	1939
Ford Motor Co.,	Dearborn, Mich.	21987	1938
Ford Motor Co.,	Dearborn, Mich.	21988	1938

Customer Address	Serial No.	Year Ordered
Ford Motor Co., Dearborn, Mich.	21989	1938
Ford Motor Co., Dearborn, Mich.	21990	1938
Ford Motor Co., Dearborn, Mich.	21991	1938
Ford Motor Co., Dearborn, Mich.	21992	1938
165 General Electric Co., Fort Wayne, Ind.	21848	1937
Harvey Machine Co., Los Angeles, Calif.	22502	1940
International Harvester Co., Milwaukee, Wisc.	21867	1937
International Harvester Co., East Moline, Ill.	22436	1940
Joseph Lucas, Ltd., Birmingham, England	21503	1936
Joseph Lucas, Ltd., Birmingham, England	21643	1937
Joseph Lucas, Ltd., Birmingham, England	21644	1937
Joseph Lucas, Ltd., Birmingham, England	21645	1937
N. V. Phillips, Endhoven, Holland	21729	1937
Revere Copper & Brass Co., Rome, N. Y. Rome Mfg. Div.	22364	1940
Revere Copper & Brass Co., Rome, N. Y. Rome Mfg. Div.	22157	1939
Servel, Inc., Evansville, Ind.	22262	1939
U. S. Navy, Bremerton, Wash. (Puget Sound Yard)	22398	1940
Worcester Pressed Steel Co., Worcester, Mass.	22321	1940

Presses on Order, but not yet installed:

Benjamin Electric Co., Des Plaines, Ill.	22553	1940
Boeing Aircraft, Seattle, Wash.	22873	1941
Boeing Aircraft, Seattle, Wash.	22874	1941
Ford Motor Co., Wiard, Mich.	22736	1941
Ford Motor Co., Wiard, Mich.	22737	1941
General Electric Co., West Lynn, Mass.	22700	1941
General Electric Co., West Lynn, Mass.	22701	1941
U. S. Navy (Norfolk Yard), Norfolk, Va.	22797	1941
U. S. Navy, Portsmouth, N. H. (Portsmouth Yard)	22643	1941

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Aug. 14, 1934. W. FERRIS 1,970,134

HYDRAULIC PRESS

Filed July 29, 1932 3 Sheets-Sheet 3

Fig. 5.

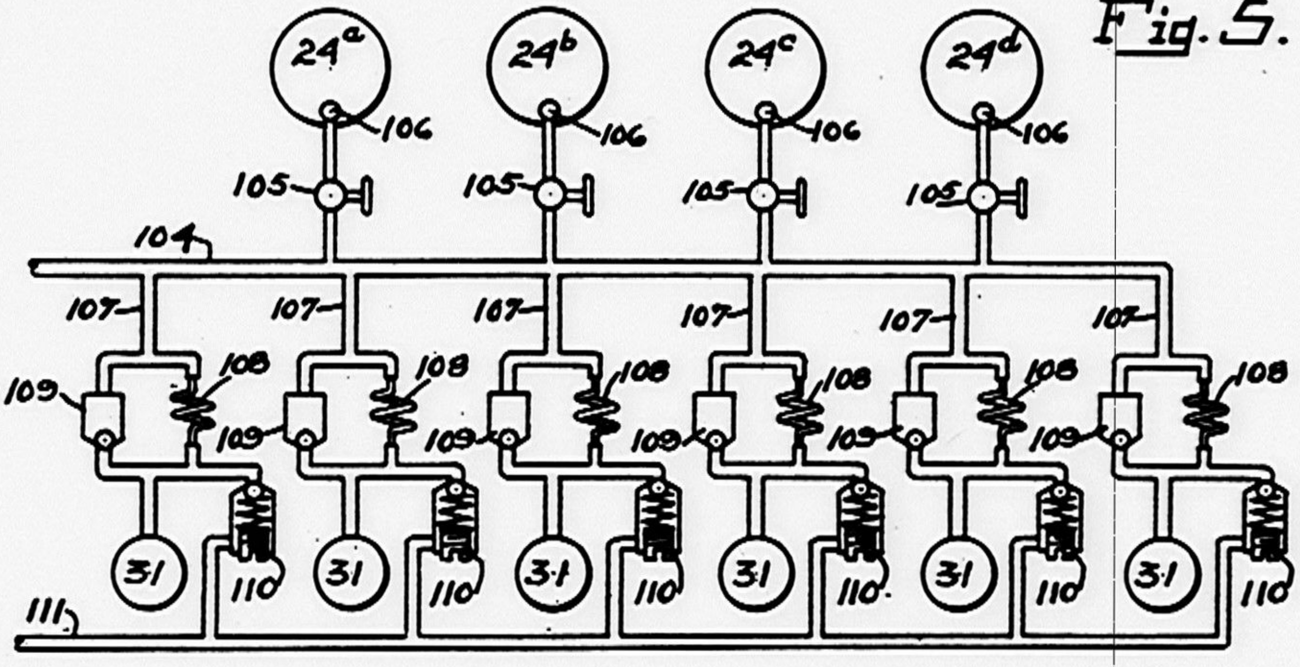


Fig. 6.

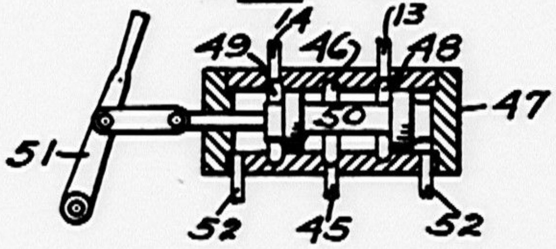


Fig. 7

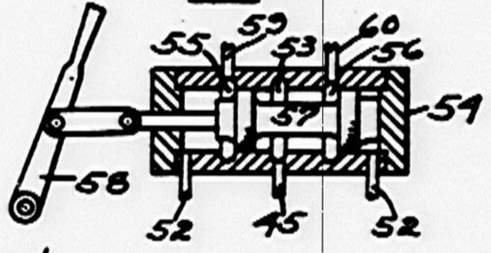


Fig. 8.

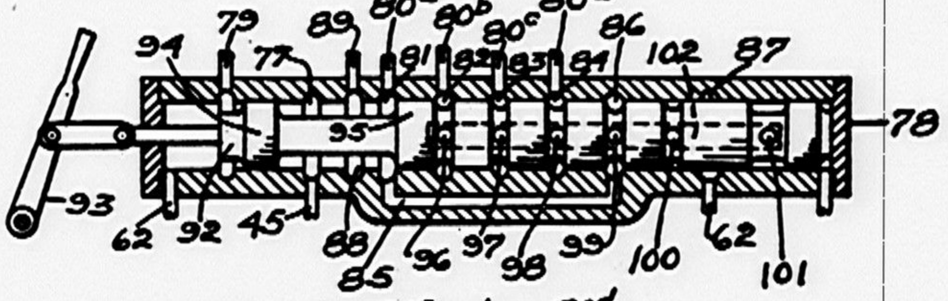


Fig. 9.

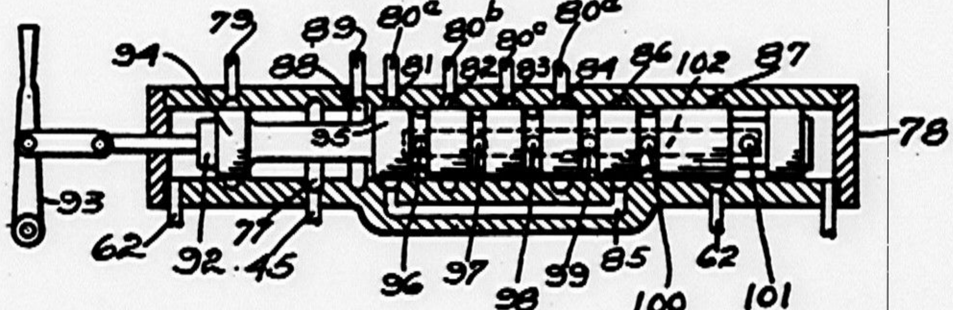
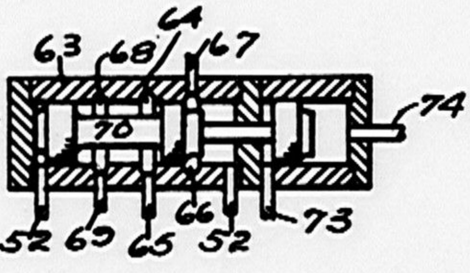


Fig. 10.



INVENTOR.
WALTER FERRIS.
BY
ATTORNEY.

Aug. 14, 1934.

W. FERRIS

1,970,134

HYDRAULIC PRESS

Filed July 29, 1932

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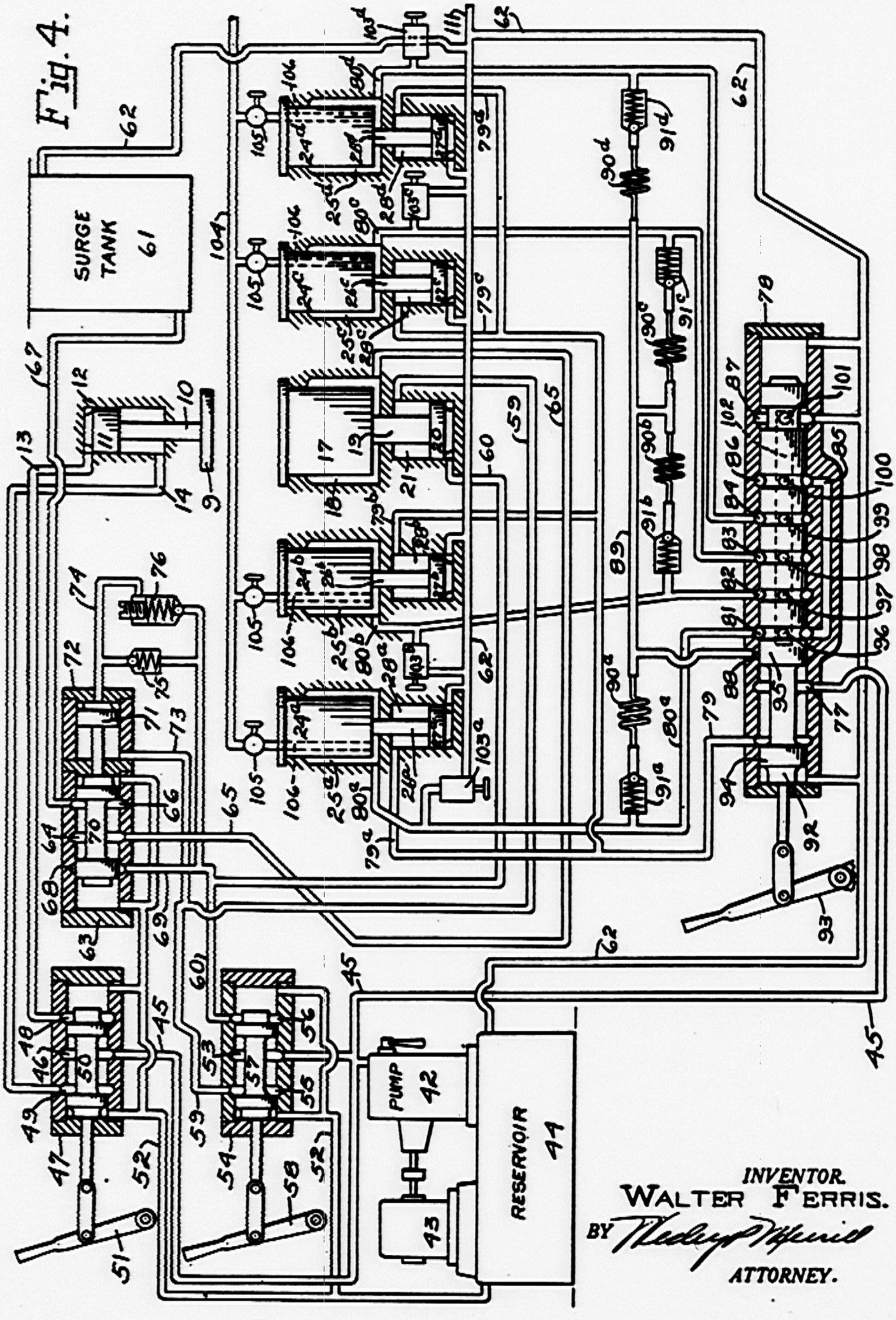
Fig. 4.



INVENTOR.

WALTER FERRIS.

BY Wesley P. Merrill

ATTORNEY.

Aug. 14, 1934. **W. FERRIS** 1,970,134

HYDRAULIC PRESS

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Fig. I.

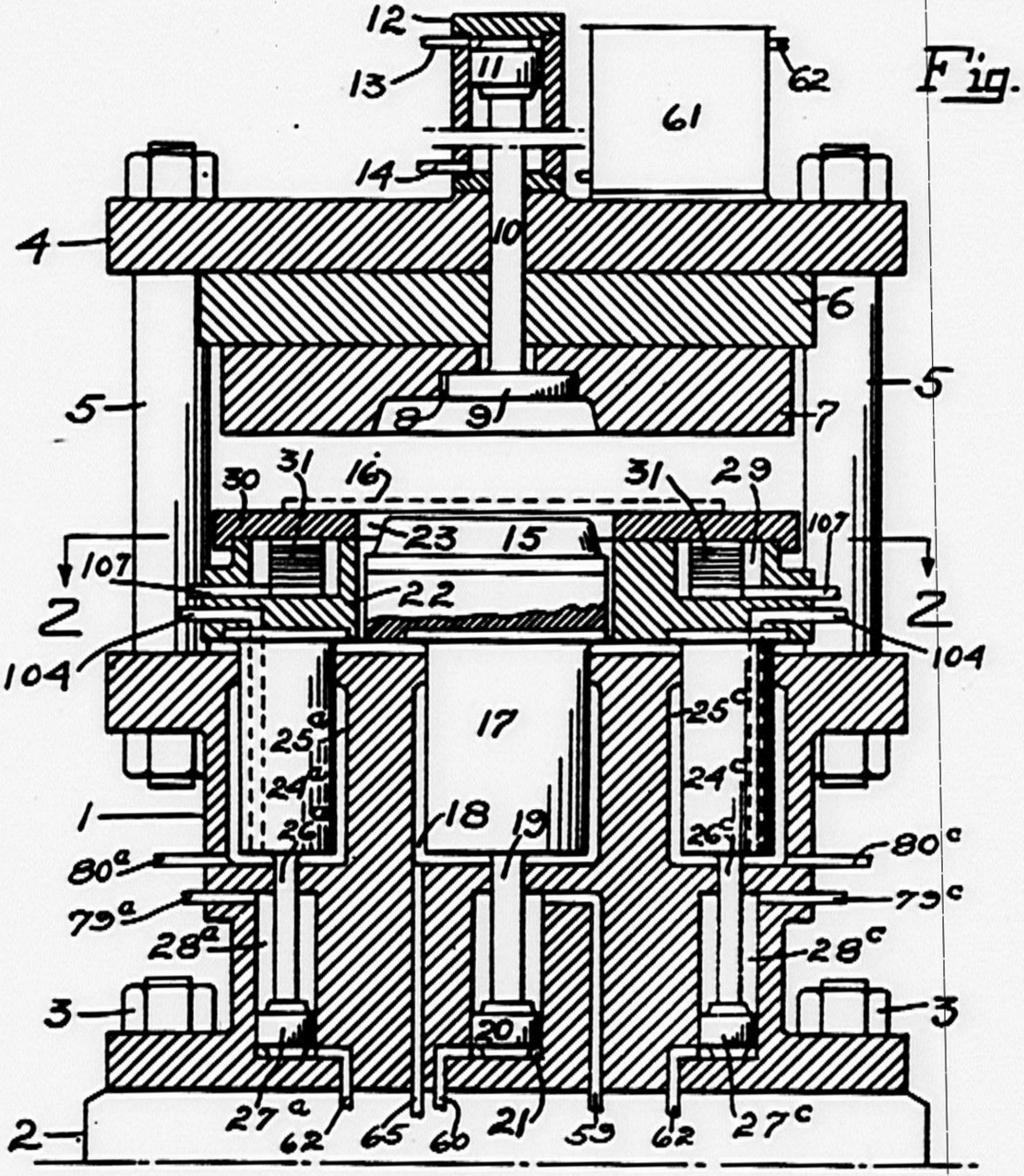


Fig. 2.

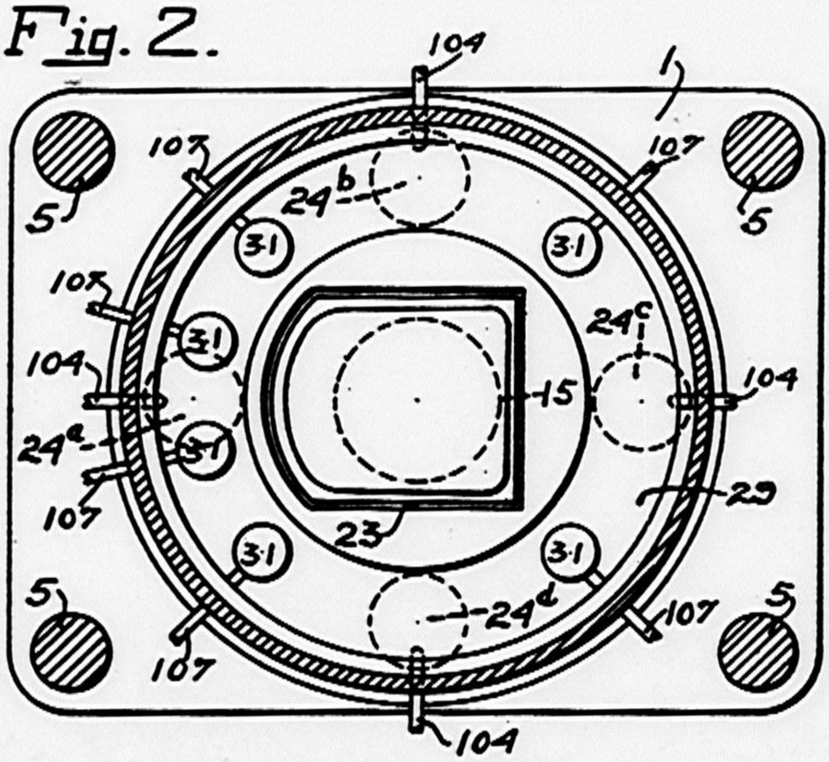
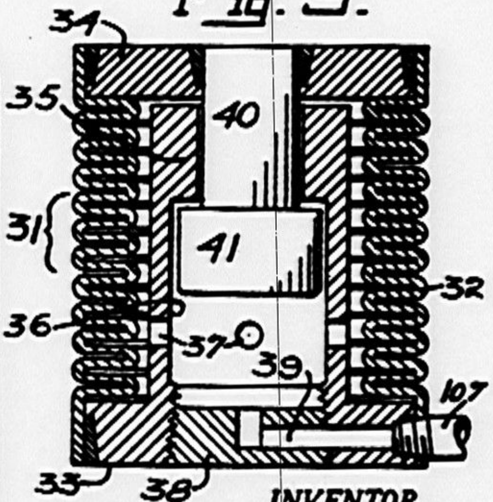


Fig. 3.



INVENTOR.
WALTER FERRIS.
BY

ATTORNEY.

Patented Aug. 14, 1934 **1,970,134**

UNITED STATES PATENT OFFICE

1,970,134

HYDRAULIC PRESS

Walter Ferris, Milwaukee, Wis., assignor to The Oilgear Company, Milwaukee, Wis., a corporation of Wisconsin

Application July 29, 1932, Serial No. 625,765

20 Claims. (Cl. 113—45)

This invention relates to draw presses.

The draw press to which the invention applies in particular is provided with a pair of dies for forming articles from sheets or blanks, a blank holder for pressing the margin of the blank against one of the dies to clamp it therebetween during the drawing operation, and means for moving one of the dies toward and from the other die. The clamping pressure applied to the margin of the blank should be carefully adjusted and, in drawing articles of non-uniform configuration, different clamping pressures should be applied to different points around the margin of the blank as the material flows at different rates from those points into the dies.

An object of the invention is to provide a draw press in which different clamping pressures may be applied to the blank at different points around the margin thereof.

Another object is to provide a press with a blank holder which may be readily adjusted to apply different pressures at different points upon the margin of a blank.

Another object is to provide a press of this character which is fluid operated.

Another object is to provide means whereby a plurality of cylinders may be supplied with pressure fluid from a single source and pressure be maintained in one cylinder while fluid is being delivered to another cylinder.

Another object is to provide a press with a fluid operated blank holder in which sylphons are employed for transmitting pressure to selected points upon the margin of the blank.

Another object is to provide a press of this character which is susceptible of close adjustment and control.

According to the invention in a general aspect, the press is provided with a plurality of cylinders which are supplied with pressure fluid from a single source, and means are provided for regulating the pressure in one cylinder without affecting the pressure in another cylinder.

According to the invention in another aspect, the press is provided with a ram cylinder and a blank holder cylinder, pressure fluid is delivered freely from a suitable source to the ram cylinder to operate a ram arranged therein, and a choke is connected between the blank holder cylinder and said source to enable the same to maintain pressure in the blank holder cylinder while delivering fluid to the ram cylinder.

According to the invention in another aspect, the blank holder of the press is provided with fluid actuated sylphons which may be moved from place to place to exert pressure upon the blank at different points around the margin thereof.

The invention is illustrated by the press shown in the accompanying drawings in which the views are as follows:

Fig. 1 is a central vertical section through the press, the view being somewhat diagrammatic in character and the piping and certain other parts being omitted or broken away.

Fig. 2 is a plan view on the line 2—2 of Fig. 1.

Fig. 3 is a central vertical section through one of the sylphons shown in Fig. 1.

Fig. 4 is a diagram of one part of the hydraulic circuit and shows the valves in central longitudinal section with the plungers thereof in the positions occupied when the press is idle.

Fig. 5 is a diagram of another part of the hydraulic circuit.

Figs. 6, 7, 8, 9 and 10 are views showing the plungers of the several valves in different positions from those shown in Fig. 4.

The press shown in Figs. 1 and 2 is provided with a base 1, which is arranged upon a suitable foundation 2 and rigidly secured in a stationary position thereon by anchor bolts 3, and with a crosshead 4 which is supported above the base 1 and fixed in a stationary position relatively thereto by four columns or strain rods 5.

The crosshead 4 carries upon the under side thereof a bolster 6 to the under side of which a stationary female die 7 is attached and provided at its center with a recess 8 to receive the head 9 of a knockout plunger 10 which extends through the bolster 6 and the crosshead 4 and has a piston 11 secured to its upper end and fitted in a knockout cylinder 12 arranged upon the top of the crosshead 4.

Liquid for advancing the plunger 10 to force a piece of work out of the die 7 is supplied to the upper end of the cylinder 12 through a pipe 13, and liquid for retracting the plunger 10 is delivered to the lower end of the cylinder 12 through a pipe 14.

The upper stationary die 7 coacts with a lower movable male die 15 to form or draw a blank 16 into the shape determined by the configuration of the dies which, as shown, are adapted to form a substantially rectangular receptacle.

The lower die 15 is moved toward and from the upper die 7 by a press ram 17 which is fitted in a cylinder 18 and provided upon its lower end with a tail rod 19 having a piston 20 fixed thereon and fitted in a cylinder 21. The cylinders 18 and 21 are arranged within and carried by the base 1 and are shown as being formed integral therewith.

During the drawing operation, the blank 16 is gripped between the lower face of the die 7 and a pressure ring 22 having formed therein a central opening 23 which accommodates the lower die 15 and conforms substantially to the periphery of the recess in the die 7.

The pressure ring 22 is moved toward and from the die 7 by four identical rams each of which is designated by the reference numeral 24 and distinguished from the other rams 24 by the addition of the exponent *a*, *b*, *c*, or *d* to its reference numeral. Each ram 24 is arranged in a cylinder 25 and provided with a tail rod 26 having a piston 27 fixed to its lower end and fitted in a cylinder 28, and the cylinders, tail rod and piston associated with each ram have the same exponent added to the reference numerals thereof as is added to the reference numeral of the ram with which the same are associated. The cylinders 25 and 28 are arranged within and carried by the base 1 and have been shown as being formed integral therewith.

The rams 24 are adapted to raise the pressure ring 22 and clamp the margin of the blank 16 between it and the lower face of the die 7, and the force or pressure exerted by any one of the rams 24 may be varied by varying the fluid pressure in its cylinder 25 to thereby apply different pressures upon different parts of the margin of the blank.

In order to further vary the pressures upon different parts of the margin of the blanks and to apply a particular pressure upon any particular point thereof irrespective of the position of that point relative to the positions of the rams 24, the pressure ring may be provided with an annular channel 29, a cover plate or top plate 30 which covers the channel and normally rests upon the side walls thereof, and a plurality of sylphons 31 which may be arranged in selected positions in the channel 29 and supplied individually with pressure fluid to exert individual pressures upon different points around the margin of the blank.

Each sylphon 31 has its side wall formed of an expansible metal bellows 32 and its ends closed by two heads 33 and 34 which are welded or otherwise rigidly secured in position to form fluid-tight joints with the bellows.

The lower head 33 has a projection 35 formed thereon and extending upward into the bellows, and the upper end of this projection may be positioned a short distance below the head 34 to limit the downward movement thereof.

The projection 35 is provided in the lower part thereof with a bore 36 which is in open communication with the interior of the bellows 32, as by perforations 37, and is closed at its lower end by a plug 38 rigidly fastened in the head 33.

The bellows 32 is expanded to raise the head 34 by liquid delivered through a duct 39 which is formed in the head 33 and communicates with the bore 36, and the upward movement of the head 34 is limited by a stop pin 40 which has its head 41 arranged in the bore 36 to engage the upper end thereof from which it is normally spaced a short distance, for instance, about one-eighth inch. The stop pin 40 extends loosely through the upper end of the projection 35 and has its upper end welded or otherwise rigidly secured to the head 34.

The syiphons are shown arranged in the channel 29 with the heads 33 downward but they may as readily be arranged therein with the heads 33 upward if so desired.

Liquid for operating the press is supplied by a positive displacement pump 42 which is driven at a constant speed by an electric motor 43 and delivers liquid from a reservoir 44 into a supply pipe 45 having three branches for the delivery of liquid to three separate control valves. A pump which may be employed is illustrated and described in Patent No. 1,798,198 issued March 31, 1931 to Walter Ferris and John P. Ferris.

One branch of the supply pipe 45 is connected to a port 46 in a control valve 47 which controls the delivery of liquid from the pump 42 to the knockout cylinder 12 and has the pipes 13 and 14 connected thereto in communication, respectively, with two ports 48 and 49 arranged upon opposite sides of the port 46.

The flow of liquid through the valve 47 is controlled by its plunger 50 which is operated by a lever 51. When the plunger 50 is in the position shown in Fig. 4, the pump 42 may deliver liquid through the supply pipe 45, the valve 47 and the pipe 14 to the lower end of the cylinder 12 and raise the piston 11, and liquid expelled from the upper end of the cylinder 12 by the piston 11 is exhausted through the pipe 13 and the valve 47 into a drain pipe 52 which is connected to both ends of the valve 47 and discharges into the reservoir 44. When the plunger 50 is in the position shown in Fig. 6, the flow of liquid in the pipes 13 and 14 is reversed and the piston 11 will force the knockout plunger 10 downward to eject the work from the die 7.

A second branch of the supply pipe 45 is connected to a port 53 in a reversing valve 54 which controls the delivery of liquid to the cylinder 21 and has two ports 55 and 56 arranged upon opposite sides of the port 53 and controlled by a plunger 57 which is operated by a lever 58. The port 55 has connected thereto one end of a pipe 59 the other end of which is connected to the upper end of the cylinder 21. The port 56 has connected thereto one end of a pipe 60 the other end of which is connected to the lower end of the cylinder 21.

When the plunger 57 is in the position shown in Fig. 4, liquid from the pump 42 may flow through the pipe 45, the valve 54 and the pipe 59 to the upper end of the cylinder 21 and move the piston 20 downward, and the liquid expelled from the lower end of the cylinder 21 by the piston 20 is exhausted through the pipe 60 and the valve 54 into the drain pipe 52 which is connected to both ends of the casing of the valve 54. When the plunger 57 is moved to the position shown in Fig. 7, the flow of liquid in the pipes 59 and 60 is reversed and the piston 20 will be moved upward.

When the piston 20 is moved upward, the ram 17 is moved upward and draws liquid into the cylinder 18 from a surge tank 61 which is ordinarily arranged upon the crosshead 4 as shown in Fig. 1. When the piston 20 moves downward, the ram 17 is moved downward and expels liquid from the cylinder 18 into the surge tank. The level of the liquid in the surge tank is limited by an overflow pipe 62 which discharges into the reservoir 44.

The flow of liquid between the cylinder 18 and the surge tank 61 is controlled by an automatic valve 63 which has a port 64 formed therein and connected by a pipe 65 to the cylinder 18, a port 66 arranged upon one side of the port 64 and connected by a pipe 67 to the surge tank, and a port 68 arranged upon the other side of the port 64 and connected by a pipe 69 to the pipe 60.

The flow of liquid through the valve 63 is controlled by its plunger 70 which is operated by a piston 71 rigidly connected to one end thereof and fitted in a cylinder 72 arranged upon one end of the valve casing. The cylinder 72 has its inner end connected to the pipe 59 by a pipe 73 and its outer end connected to the pipe 60 by a pipe 74 which has a check valve 75 and a resistance valve 76 connected in parallel therein. The check valve 75 permits liquid to be exhausted freely from the outer end of the cylinder 72 but forces liquid delivered thereto to pass through the resistance valve 76.

When the valve plunger 57 has been moved to the position shown in Fig. 7 and liquid delivered to the lower end of the cylinder 21 has raised the piston 20 and the ram 17 until sufficient resistance has been encountered by the ram to cause the pressure in the pipe 60 to rise sufficiently to overcome the resistance of the valve 76, liquid will break through the valve 76, enter the cylinder 72 and move the piston 71 and the valve plunger 70 to the position shown in Fig. 10, thereby closing communication between the cylinder 18 and the surge tank 61 and opening communication between the cylinder 18 and the pipe 60 which at this time is in direct communication with the pump 42 through the valve 54 and the supply pipe 45. Liquid from the pump 42 then flows to the cylinder 18 and acts upon the ram 17 and causes it to exert a high pressure upon the blank being formed between the dies 7 and 15.

The third branch of the supply pipe 45 is connected to a port 77 in a blank holder valve 78 through which liquid is delivered to the blank holder cylinders 25 and 28.

Liquid is delivered to and discharged from the upper ends of the cylinders 28 through a pipe 79 which is connected to the casing of the valve 78 at the left of the port 77 and is provided with four branches 79^a, 79^b, 79^c and 79^d which are connected, respectively, to the cylinders 28^a, 28^b, 28^c and 28^d. In order that the pistons 27 may reciprocate freely, the lower end of each cylinder 28 is connected to the overflow pipe 62.

The four cylinders 25^a, 25^b, 25^c and 25^d are connected, respectively, by four pipes 80^a, 80^b, 80^c and 80^d to four ports 81, 82, 83 and 84 which are formed in the casing of the valve 78 at the right of the port 77 and equally spaced from each other, and the port 81 is connected by a duct 85 to a port 86 arranged at the right of the port 84.

The casing of the valve 78 also has a port 87 arranged therein at the right of the port 86 and a port 88 arranged between the ports 77 and 81. The overflow pipe 62 is connected to the port 87 and to both ends of the valve casing, and the port 88 has a pipe 89 connected thereto. The pipe 89 is connected to the four pipes 80^a, 80^b, 80^c and 80^d through four chokes 90^a, 90^b, 90^c and 90^d and four check valves 91^a, 91^b, 91^c and 91^d, respectively. The chokes 90 allow a very limited volume of liquid to flow from the pipe 89 to each pipe 80 and the check valves 91 prevent the flow of liquid in the opposite direction.

The flow of liquid through the valve 78 is controlled by its plunger 92 which is operated by a lever 93 and provided with a piston 94, to control communication between the pipe 79 and the port 77, and with an elongated piston 95 to control communication between the port 77 and the other ports. The elongated piston 95 is provided with transverse passageways 96, 97, 98, 99, 100 and 101 which, when the plunger 92 is in the position shown in Fig. 4, register with the ports 81, 82, 83, 84, 86 and 87 respectively. The transverse passageways all communicate with each other through a longitudinal passageway 102 which is formed within the elongated piston 95 and closed at each of its ends.

When the plunger 92 is in the position shown in Fig. 4, liquid from the supply pipe 45 may flow through the valve 78 and move the pistons 27 and the rams 24 downward, and the liquid expelled from the cylinders 25 by the rams 24 may flow through the pipes 80 and the valve 78 to the overflow pipe 62.

When the plunger 92 is in the position shown in Fig. 8, the port 81 is open to the port 77 and communication is established between the port 77 and the ports 82, 83, and 84 through the transverse passageways 96, 97 and 98, the longitudinal passageway 102, the transverse passageway 99, the duct 85 and the port 81, thereby permitting liquid to flow from the supply pipe 45 through the valve 78 and the pipes 80 to the cylinders 25 and raise the rams 24 to grip the blank 16 between the pressure ring 22 and the die 7. The pressure which the rams 24^a, 24^b, 24^c and 24^d may exert upon the blank is limited, respectively, by adjustable resistance valves 103^a, 103^b, 103^c, and 103^d connected between the pipes 80^a, 80^b, 80^c and 80^d, respectively, and the overflow pipe 62.

When the valve 78 has its plunger 92 in the position shown in Fig. 9, the ports 81, 82, 83, 84 and 86 are closed by the piston 95 to prevent the escape of liquid from the cylinders 25 through the valve 78, and the port 88 is open to the port 77 to permit pressure to extend from the supply pipe 45 through the pipe 89, the chokes 90 and check valves 91 into the cylinders 25 to maintain pressure therein. The pressure in each cylinder 25 is determined by its resistance valve 103 which may be adjusted to vary that pressure, and a variation in pressure in one cylinder 25 is prevented from affecting the pressure in any other cylinder 25 by the chokes 90 and the check valves 91. Consequently, the pressure in each cylinder 25 is independent of the pressure in any other cylinder 25.

Liquid for operating the sylphons 31 is supplied thereto through a manifold pipe 104 which is connected to each cylinder 25 through a shutoff valve 105 and a duct 106 formed in the ram 24 and extending therethrough.

If all of the shutoff valves 105 remained open, pressure in all of the cylinders 25 would equalize through the pipe 104 and the maximum pressure obtainable therein would be determined by the resistance valve 103 which was adjusted to open at a lower pressure than the other resistance valves 103. In order to permit different pressures to be created in the several cylinders 25, all of the shutoff valves 105 are closed except the one which is connected to the cylinder 25 whose resistance valve 103 is adjusted to open at a pressure higher than the pressure required to open the other resistance valves 103. Consequently, the pipe 104 may have a pressure created therein which is substantially equal to the highest pressure created in any of the cylinders 25.

Each sylphon 31 is connected to the pipe 104 by a pipe 107 (Fig. 5) which has a choke 108 and a check valve 109 connected in parallel therein. The choke 108 permits liquid to flow from the pipe 104 to the sylphon 31 at a limited rate, and the check valve 109 permits liquid to flow freely from the sylphon 31 to the pipe 104 but prevents it from flowing in the opposite direction except through the choke 108.

The pressure in each sylphon 31 is limited by an adjustable resistance valve 110 which has its inlet connected thereto and its outlet connected to a drain pipe 111 which discharges into the overflow pipe 62. Each resistance valve 110 is adjusted to open at the maximum pressure desired in the sylphon to which it is connected and, as the chokes 108 limit the flow of liquid to each sylphon, a different pressure may be obtained in each sylphon and the pressure in any sylphon may be regulated or varied without affecting the pressure in any other sylphon.

The combined capacity of all of the chokes 108 is less than the capacity of one choke 90 in order that each choke 90 may supply to the cylinder 25 to which it is connected a volume of liquid sufficient to maintain therein the maximum pressure determined by the adjustment of the resistance valve 103 connected thereto and to also maintain the desired maximum pressures in the several sylphons.

Assuming that the pump 42 is running and that the several rams, pistons and valve plungers are in the positions shown in Fig. 4, the pump will have created a predetermined pressure in the upper ends of the cylinders 21 and 28 and in the lower end of the cylinder 12 and automatically reduced its stroke until it is delivering just sufficient liquid to compensate for leakage and maintain that pressure constant, as fully described in Patent No. 1,798,198 referred to above.

If the lever 93 is then operated to move the plunger 92 of the valve 78 to the position shown in Fig. 8, liquid from the pump 42 will flow through the supply pipe 45, the valve 78 and the pipes 80 to the lower ends of the cylinders 25 and raise the rams 24 which will raise the pressure ring 22 to move the blank 16 into contact with the upper die 7. The plunger 92 is ordinarily retained in this position until sufficient pressure has been created in the several cylinders 25 to open one of the resistance valves 103, thereby causing the margin of the blank 16 to be gripped between the pressure ring 22 and the upper die 7.

At the same time, liquid flows through the shutoff valve 105 which is open and then through the pipes 104 and 107 and the chokes 108 to the sylphons 31 and creates pressure therein to cause the sylphons to exert pressure upon the margin of the blank at different points thereon.

The lever 93 is then operated to move the plunger 92 of the valve 78 to the position shown in Fig. 9 in which position it blocks the ports 81, 82, 83 and 84 and prevents the escape of liquid from the cylinders 25 but leaves the port 88 open to the port 77 to permit liquid to flow from the supply pipe 45 into the pipe 89 and through the chokes 90 and check valves 91 into the several cylinders 25 to maintain or create in each cylinder 25 a pressure sufficient to open the resistance valve 103 connected thereto, thereby maintaining a particular pressure in each cylinder.

At the same time, liquid flows from one of the cylinders 25 through the duct 106, the open shutoff valve 105, the pipes 104 and 107 of the chokes 108 to the several sylphons 31 and creates or maintains in each a predetermined pressure in accordance with the adjustment of the resistance valve 110 connected thereto.

The lever 58 is then operated to move the plunger 57 of the valve 54 to the position shown in Fig. 7 to open the pipe 59 to the drain pipe 52 and open the pipe 60 to the pipe 45, thereby permitting liquid from the pump 42 to flow through the pipe 60 to the lower end of the cylinder 21 and raise the piston 20 and the ram 17, the liquid in the upper end of the cylinder 21 being exhausted through the pipe 59 and the valve 54 into the drain pipe 52 and the ram 17 drawing liquid into its cylinder 18 from the tank 61 through the pipe 65, the valve 63 and the pipe 67 as previously described.

When the plunger 57 of the valve 54 is shifted to open the pipe 60 to the pipe 45, the pressure in the pipes 45 and 89 drops momentarily but the check valves 91 and 109 prevent a material drop in the pressures in the cylinders 25 and in the sylphons 31.

Engagement of the die 15 with the blank 16 retards the upward movement of the piston 20 and causes the pressure in pipes 60 and 69 to rise until liquid breaks through the resistance valve 76 and operates the piston 71 to move the plunger 70 of the valve 63 to the position shown in Fig. 10, thereby closing the pipe 65 to the pipe 67 and opening it to the pipe 60 through the pipe 69.

Liquid from the pump 42 now flows through the valve 63 and the pipe 65 to the cylinder 18 and continues to flow through the pipe 60 to the cylinder 21, thus acting upon the combined effective areas of the ram 17 and the piston 20 and moving the ram upwardly to force the die 15 into the die 7 and draw or form an article from the blank 16. At the same time, a limited volume of liquid is flowing through the chokes 90 to maintain or create the desired pressures in the cylinders 28 and the sylphons 31.

The press is thus operated by liquid supplied from a single pump, pressure is maintained in its blank-holding cylinders and sylphons while the press ram is being operated, and the pressure in each blank-holding cylinder or sylphon is substantially independent of the pressure in any other blank-holding cylinder or sylphon.

After the blank has been formed, the levers 58 and 93 are operated to return the valve plungers 57 and 94 into the positions shown in Fig. 4. Liquid may now flow through the valve 54 to the upper end of the cylinder 21 and through the valve 78 to the upper ends of the cylinders 28 and retract the rams 17 and 24 to their initial positions, as previously described.

The lever 51 is then operated to move the plunger 50 of the valve 47 to the position shown in Fig. 6, thereby permitting liquid from the pump 42 to flow into the upper end of the cylinder 12 to advance the piston 11 and cause the plunger 10 to eject the finished article from the die 7. The lever 51 is then operated to return the plunger 50 to the position shown in Fig. 4 and thereby permit liquid to flow to the lower end of the cylinder 12 and retract the piston 11 to its initial position.

The invention herein set forth is susceptible of various modifications and adaptations without departing from the scope thereof as hereafter claimed.

The invention is hereby claimed as follows:

1. The combination, with a source of pressure fluid, of a holding cylinder, a power cylinder having a plunger fitted therein, means for delivering fluid freely from said source to each of said cylinders selectively to create a predetermined pressure in said holding cylinder and to operate said plunger, and means connected between said source and said holding cylinder to enable said

source to maintain said predetermined pressure substantially constant while delivering fluid freely to said power cylinder.

2. The combination, with a pump, of two cylinders, means for delivering fluid freely from said source to the first of said cylinders and then to the second cylinder to create pressure therein, and additional means connected between said pump and the first of said cylinders to enable said pump to deliver a limited volume of fluid to that cylinder while delivering fluid freely to the second cylinder.

3. The combination, with a holding cylinder and a power cylinder, of a pump for supplying fluid to said cylinders, means for delivering fluid from said pump to said power cylinder freely, and means for simultaneously delivering fluid from said pump to said holding cylinder and including a choke for limiting the flow of fluid thereto and a check valve for preventing the free escape of fluid therefrom.

4. The combination, with a power cylinder and a holding cylinder, of a pump for supplying fluid to said cylinders, fluid channels for connecting said holding cylinder to said pump, valve means for directing fluid from said pump through said channels to said holding cylinder to create pressure therein and operable to block said channels between said holding cylinder and said pump, means for directing fluid from said pump to said power cylinder, and a choke connected between said cylinders to enable said pump to deliver a limited volume of fluid to said holding cylinder while delivering fluid to said power cylinder.

5. The combination, with a source of pressure fluid, of a plurality of holding cylinders, a power cylinder having a plunger fitted therein, means for delivering fluid freely from said source to each of said cylinders to create pressure in said holding cylinders and to operate said plunger, and means connected between said source and said holding cylinders to enable said source to maintain pressure in said holding cylinders while delivering fluid freely to said power cylinder, and means for regulating the pressure in one holding cylinder independently of the pressure in another holding cylinder.

6. The combination, with a plurality of holding cylinders and a power cylinder, of a pump for supplying fluid to said cylinders, means for delivering fluid from said pump to said power cylinder freely, means for simultaneously delivering fluid from said pump to said holding cylinders and including a choke for limiting the flow of fluid to each holding cylinder and a check valve for preventing the free escape of fluid therefrom, and means for regulating the pressure in one holding cylinder independently of the pressure in another holding cylinder.

7. The combination, with a power cylinder and a plurality of holding cylinders, of a pump for supplying fluid to said cylinders, fluid channels for connecting said holding cylinders to said pump, valve means for directing fluid from said pump through said channels to said holding cylinders to create pressure therein and operable to block said channels between said holding cylinders and said pump, means for directing fluid from said pump to said power cylinder, and a choke connected between said power cylinder and each of said holding cylinders to enable said pump to deliver limited volumes of fluid to said holding cylinders while delivering fluid to said power cylinder, and means for regulating the pressure in one holding cylinder independently of the pressure in another holding cylinder.

8. A draw press, comprising a frame having a stationary die and a movable die for operating upon a blank, a cylinder arranged in said frame and having a ram fitted therein for advancing said movable die toward said stationary die and retracting it therefrom, a blank holder having a pressure ring to grip the blank between it and said stationary die and means for advancing said pressure ring toward said stationary die and retracting it therefrom, a pump, means for delivering fluid from said pump to said cylinder to operate said ram, a plurality of fluid actuated pressure units carried by said pressure ring to exert pressure upon different parts of the blank, means for delivering fluid to said units to operate the same, and means for varying the pressure exerted by each unit upon the blank.

9. A draw press, comprising a frame having a stationary die and a movable die for operating upon a blank, a cylinder arranged in said frame and having a ram fitted therein for advancing said movable die toward said stationary die and retracting it therefrom, a blank holder having a pressure ring to grip the blank between it and said stationary die and means for advancing said pressure ring toward said stationary die and retracting it therefrom, a pump, means for delivering fluid from said pump to said cylinder to operate said ram, a plurality of fluid actuated pressure units connected in parallel and carried by said pressure ring to exert pressure upon different parts of the blank, means for delivering fluid to said units to operate the same including a choke and a check valve connected to each unit in parallel with each other, and means for varying the pressure exerted by each unit upon the blank.

10. A draw press, comprising a frame having a stationary die and a movable die for operating upon a blank, a cylinder arranged in said frame and having a ram fitted therein for advancing said movable die toward said stationary die and retracting it therefrom, a blank holder having a pressure ring to grip the blank between it and said stationary die and a plurality of fluid motors for advancing said pressure ring toward said stationary die and retracting it therefrom, a pump, means for delivering fluid from said pump to said motors to operate the same and create pressure therein, means for delivering fluid to said ram cylinder to operate said ram, a plurality of pressure units carried by said pressure ring to exert pressure upon different parts of the blank, and means for connecting said pressure units in circuit with said motors.

11. A draw press, comprising a frame having a stationary die and a movable die for operating upon a blank, a cylinder arranged in said frame and having a ram fitted therein for advancing said movable die toward said stationary die and retracting it therefrom, a blank holder having a pressure ring to grip the blank between it and said stationary die and a plurality of fluid motors for advancing said pressure ring toward said stationary die and retracting it therefrom, a pump, means for delivering fluid from said pump to said motors to operate the same and create pressure therein, means for limiting the pressure in each motor, means for delivering fluid to said ram cylinder to operate said ram, a plurality of pressure units carried by said pressure ring to exert pressure upon different parts of the blank, means for connecting said pressure units to each

of said motors for the flow of fluid therebetween, and a shutoff valve connected between said pressure units and each motor.

12. A draw press, comprising a frame having a stationary die and a movable die for operating upon a blank, a cylinder arranged in said frame and having a ram fitted therein for advancing said movable die toward said stationary die and retracting it therefrom, a blank holder having a pressure ring to grip the blank between it and said stationary die and a plurality of fluid motors for advancing said pressure ring toward said stationary die and retracting it therefrom, a pump, means for delivering fluid from said pump to said motors to operate the same and create pressure therein, means for delivering fluid to said ram cylinder to operate said ram, a plurality of pressure units carried by said pressure ring to exert pressure upon different parts of the blank, means for connecting said pressure units in circuit with said motors, and means for limiting the pressure in one pressure unit independently of the pressure in another pressure unit.

13. A draw press, comprising a frame having a stationary die and a movable die for operating upon a blank, a cylinder arranged in said frame and having a ram fitted therein for advancing said movable die toward said stationary die and retracting it therefrom, a blank holder having a pressure ring to grip the blank between it and said stationary die and a plurality of fluid motors for advancing said pressure ring toward said stationary die and retracting it therefrom, a pump, means for delivering fluid from said pump to said motors to operate the same and create pressure therein, means for limiting the pressure in each motor, means for delivering fluid to said ram cylinder to operate said ram, a plurality of pressure units carried by said pressure ring to exert pressure upon different parts of the blank, means for connecting said pressure units to each of said motors for the flow of fluid therebetween, a shutoff valve connected between said pressure units and each motor, and means for limiting the pressure in one pressure unit independently of the pressure in another pressure unit.

14. A draw press, comprising a frame having a stationary die and a movable die for operating upon a blank, a cylinder arranged in said frame and having a ram fitted therein for advancing said movable die toward said stationary die and retracting it therefrom, a blank holder having a pressure ring to grip the blank between it and said stationary die and a plurality of fluid motors for advancing said pressure ring toward said stationary die and retracting it therefrom, a pump, means for delivering fluid from said pump to said motors to operate the same and create pressure therein, means for diverting said delivery of fluid from said motors to said ram cylinder to operate said ram, a choke connected between each of said motors and said ram cylinder for enabling said pump to deliver a limited volume of fluid to each motor to maintain pressure therein while delivering fluid freely to said ram cylinder to operate said ram, and a check valve connected in series with said choke for preventing the flow of fluid therethrough in the opposite direction.

15. A draw press, comprising a frame having a stationary die and a movable die for operating upon a blank, a cylinder arranged in said frame and having a ram fitted therein for advancing said movable die toward said stationary die and retracting it therefrom, a blank holder having a pressure ring to grip the blank between it and said stationary die and a plurality of fluid motors for advancing said pressure ring toward said stationary die and retracting it therefrom, a pump, means for delivering fluid from said pump to said motors to operate the same and create pressure therein, means for diverting said delivery of fluid from said motors to said ram cylinder to operate said ram, a choke connected between each of said motors and said ram cylinder for enabling said pump to deliver a limited volume of fluid to each motor to maintain pressure therein while delivering fluid freely to said ram cylinder to operate said ram, a check valve connected in series with said choke for preventing the flow of fluid therethrough in the opposite direction, and means for regulating the pressure in one motor independently of the pressure in another motor.

16. A draw press, comprising a frame having a stationary die and a movable die for operating upon a blank, a cylinder arranged in said frame and having a ram fitted therein for advancing said movable die toward said stationary die and retracting it therefrom, a blank holder having a pressure ring to grip the blank between it and said stationary die and a plurality of fluid motors for advancing said pressure ring toward said stationary die and retracting it therefrom, a pump, means for delivering fluid from said pump to said motors to operate the same and create pressure therein, means for diverting said delivery of fluid from said motors to said ram cylinder to operate said ram, a choke connected between each of said motors and said ram cylinder for enabling said pump to deliver a limited volume of fluid to each motor to maintain pressure therein while delivering fluid freely to said ram cylinder to operate said ram, a check valve connected in series with said choke for preventing the flow of fluid therethrough in the opposite direction, a plurality of pressure units carried by said blank holder to exert pressure upon the blank, and means for delivering fluid to said pressure units to operate the same.

17. A draw press, comprising a frame having a stationary die and a movable die for operating upon a blank, a cylinder arranged in said frame and having a ram fitted therein for advancing said movable die toward said stationary die and retracting it therefrom, a blank holder having a pressure ring to grip the blank between it and said stationary die and a plurality of fluid motors for advancing said pressure ring toward said stationary die and retracting it therefrom, a pump, means for delivering fluid from said pump to said motors to operate the same and create pressure therein, means for diverting said delivery of fluid from said motors to said ram cylinder to operate said ram, a choke connected between each of said motors and said ram cylinder for enabling said pump to deliver a limited volume of fluid to each motor to maintain pressure therein while delivering fluid freely to said ram cylinder to operate said ram, a check valve connected in series with said choke for preventing the flow of fluid therethrough in the opposite direction, means for regulating the pressure in one motor independently of the pressure in another motor, a plurality of pressure units carried by said blank holder to exert pressure upon the blank, and means for delivering fluid to said pressure units to operate the same.

18. A draw press, comprising a frame having a stationary die and a movable die for operating

upon a blank, a cylinder arranged in said frame and having a ram fitted therein for advancing said movable die toward said stationary die and retracting it therefrom, a blank holder having a pressure ring to grip the blank between it and said stationary die and a plurality of fluid motors for advancing said pressure ring toward said stationary die and retracting it therefrom, a pump, means for delivering fluid from said pump to said motors to operate the same and create pressure therein, means for diverting said delivery of fluid from said motors to said ram cylinder to operate said ram, a choke connected between each of said motors and said ram cylinder for enabling said pump to deliver a limited volume of fluid to each motor to maintain pressure therein while delivering fluid freely to said ram cylinder to operate said ram, a check valve connected in series with said choke for preventing the flow of fluid therethrough in the opposite direction, a plurality of pressure units carried by said blank holder to exert pressure upon the blank, means for delivering fluid to said pressure units to operate the same, and means for limiting the pressure in one pressure unit independently of the pressure in another pressure unit.

19. A draw press, comprising a frame having a stationary die and a movable die for operating upon a blank, a cylinder arranged in said frame and having a ram fitted therein for advancing said movable die toward said stationary die and retracting it therefrom, a blank holder having a pressure ring to grip the blank between it and said stationary die and a plurality of fluid motors for advancing said pressure ring toward said stationary die and retracting it therefrom, a pump, means for delivering fluid from said pump to said motors to operate the same and create pressure therein, means for diverting said delivery of fluid from said motors to said ram cylinder to operate said ram, a choke connected between each of said motors and said ram cylinder for enabling said pump to deliver a limited volume of fluid to each motor to maintain pressure therein while delivering fluid freely to said ram cylinder to operate said ram, a check valve connected in series with said choke for preventing the flow of fluid therethrough in the opposite direction, means for regulating the pressure in one motor independently of the pressure in another motor, a plurality of pressure units carried by said blank holder to exert pressure upon the blank, means for delivering fluid to said pressure units to operate the same, and means for limiting the pressure in one pressure unit independently of the pressure in another pressure unit.

20. A draw press, comprising a frame having a stationary die and a movable die for operating upon a blank, a cylinder arranged in said frame and having a ram fitted therein for advancing said movable die toward said stationary die and retracting it therefrom, a blank holder having a pressure ring to grip the blank between it and said stationary die and a plurality of fluid motors for advancing said pressure ring toward said stationary die and retracting it therefrom, a pump, means for delivering fluid from said pump to said motors to operate the same and create pressure therein, means for diverting said delivery of fluid from said motors to said ram cylinder to operate said ram, a choke connected between each of said motors and said ram cylinder for enabling said pump to deliver a limited volume of fluid to each motor to maintain pressure therein while delivering fluid freely to said ram cylinder to operate said ram, a check valve connected in series with said choke for preventing the flow of fluid therethrough in the opposite direction, means for regulating the pressure in one motor independently of the pressure in another motor, a plurality of pressure units connected in parallel with each other and carried by said pressure ring to exert pressure upon different parts of the blank, a relief valve connected to each pressure unit for limiting the pressure therein, and means for connecting said pressure units to each of said motors for the flow of fluid therebetween and including a shutoff valve connected between each motor and said pressure units and a choke and a check valve connected to each pressure unit in parallel with each other.

WALTER FERRIS.

II.

TESTIMONY.

* * * * * * * * * *

14 Washington, D. C.,
Tuesday, November 4, 1941.

The above-entitled case came on for hearing at ten o'clock a. m., before Mr. Justice McGuire.

Appearances:

On behalf of the plaintiffs, Harry A. Toulmin, Jr., Esq., and John M. Mason, Esq.

On behalf of the defendant, E. L. Reynolds, Esq.

The Clerk: Hydraulic Press Corporation v. Coe. Are counsel ready?

Mr. Toulmin. The plaintiffs are ready.

15 *Proceedings.*

The Court. Proceed.

Mr. Toulmin. My name is Toulmin, if your Honor please. I am a member of the bar.

We have here this morning an action by the Hydraulic Press Corporation and the inventor, Walter Ernst, who has assigned his patent on a hydraulic press to that corporation, and this suit is brought under Section 4915 of the Revised Statutes to review the action of the Patent Office in failing to grant a patent to Mr. Ernst. The application was prosecuted before the Office in due course, and was denied, and, on appeal, a decision was rendered by the Board of Appeals adversely to us.

There are three claims involved, and we are now here seeking the granting of the patent under those claims. Your Honor will find that these three claims are recited on page 5 of the complaint. They are numbers 4, 5 and 7, and they constitute the issues that are here before the Court.

At this point I would like to suggest to the Court that we have a fundamental question of law in this case, namely, whether a claim can be anticipated and therefore denied by the citation of a patent dealing only with mechanism and not with a method. We rely, on that point of law, as I shall submit it to your Honor in a few minutes, on the old Cambria Iron Company case, with which your Honor is familiar, and the series of cases which have been 16 subsequently decided by the Court of Appeals in this District and by the various Courts of Appeals throughout the United States, to the effect that you cannot have an anticipation of method claimed by a so-called mechanical device unless it is inevitably the same as in the method case. I will hand up a very brief memorandum of authorities to refresh your Honor's memory on the subject before the hearing is ended.

The issue before the Court on a matter of fact involves a single prior patent under the name of Ferris. That is the only prior patent which anticipates somewhat these three method claims. The issue, therefore, is a very sharp one; that is, as to whether or not the disclosures of that patent, passing the question of law for the moment, show a method which would be inevitably practiced by the construction of that patent. That is the same as called for by these three claims.

In reviewing the proceedings in the Patent Office, I think the Court will ultimately come to agreement with us. It is our view that serious errors of understanding of fact, or rather misstatements of fact, or where the question of the finding of fact would be an error in the Patent Office, as appeared in the Ernst application, in the Board of Appeals opinion they have made several fundamental observations about the construction and method of operation of the Ernst application, and those several observations 17 are entirely contrary to the specification itself and in conflict with it.

So we shall rely before your Honor, and I want to point out briefly here in the opening statement certain things in connection with the several errors of fact which led the Patent Office into the error of which complaint is made, because if the Patent Office had not done that then the patent would have been issued.

The method of operation of the Ernst patent is wholly different from the Ferris patent.

So you will have before you two issues for decision; one, the question of law, and, second, a question of fact with the subsequent interpretation of the law based upon those facts.

As your Honor will recall, the question of anticipation is one of mixed law and fact, as the Supreme Court has said.

Appearing here this morning with your Honor's leave, we want to produce, in addition to some depositions, a technical witness, an expert, for the purpose of explaining the situation to the Court, because his testimony has been very helpful to me and I think it would be to the Court, and with your leave I would like to call one witness.

In conclusion let me say that we have one deposition here by the Executive Vice-President of the corporation in charge of the sales of this commercial article, and you will
find that this has been a successful, a very successful,
18 sales proposition, and that the sales have been very
large. These sales have been to many very large corporations, manufacturers of various classes of metals, such as the Ford Motor Company and the United States Navy Yards, the General Electric Company, and they must press metal into different shapes and forms.

One word as to the nature of the apparatus. I want to refer to one general illustration which is an exhibit in the case—in Exhibit No. 2, on page 9, which I will hand up to the Court. I merely am going to give to your Honor a sort of birds-eye view of this subject-matter so that you will orient yourself to the testimony.

You see on page 9, entitled Figure 4841, which I think your Honor has before you, a large structure known as a hydraulic press; that is, it is a machine for pressing metal in different shapes, as for instance a gasoline tank or the lamp on your automobile or things of that character, where you must have a very deep draw of metal. The sheets of metal are quite thin and therefore it is a major problem to draw your metal accurately and smoothly.

This press, starting at the bottom and working up, consists of a base, and you will see an opening just above the base which is called the bed of the press and in that opening some sort of a die for forming the shape may be placed and on top of that will be placed a sheet of metal, sheet steel. Just above that sheet steel or that opening they place what is known as a hold out. That is about at
19 this point, and it is one of the essential issues in this case, its operation, and it is difficult to hold down that blank holder. The sheet of steel which is to be used from which the article is to be pressed is in this case called a blank holder. We take the metal and stick it in this holder or this opening. We are going to bring this negative over, and we are going to bring that over by hydraulic pressure to form that sheet into some particular configuration or size.

For instance, we take the sheets in advance on pages 6 and 7, and you will notice—this is a blank headlamp, the No. 1 at the bottom of page 6; then the pressing operation is performed by Nos. 2, 3 and 4 and finally we have the form Nos. 5, 6 and 7—7 being the lamp housing—and I am referring now to pages 6 and 7 on Exhibit 2. I have in this exhibit a number of such catalogs showing these things, showing this mechanism in the various stages of operation.

Turning back to page 9, to complete that explanation, that is a view of the whole press. When this press on which I have my pencil, the large flat member about half way of the press, is pushed down by this rod, the first thing that takes place is that the blank holder which is below the blank comes up into contact with the margins of the sheet of metal or blanks, so if your Honor will follow my hands we

have a sheet of metal, there is a blank holder which comes
down and engages the sides of the sheet to hold it
20 while the punching or pressing operation is per-
formed by the platen, so that you have the holder
around the margin to hold it peripherally and the force is applied through that center to hold it so it will not be moved, so that the operation is the problem in such a device, because it is due to some disfiguration of the metal.

The problem is this; not to provide a hold-down, but the problem is to provide a hold-down which will be automatic in its operation, working the metal proportional to the tonnage that is applied to it.

I should have stated before that the tonnage applied to this piece of metal is very large. These metals are quite of large size. They are enormous in construction ordinarily and the force applied is tremendous to these heavy sheets of metal, and have to be drawn so deeply that it is necessary to have this tremendous force. This force, which is a part of this case, is applied by what is known as a hydraulic motor. We have a hydraulic motor which drives a pump and that pump is of a special design and it supplies a force of about two thousand pounds per square inch. Of course it is very expensive to produce it because the consumption of hydraulic current is very high.

One of the objects of this invention is to economize on the consumption, because of the vast consumption of such
hydraulic power. The oil under this pressure is used
21 in a tank which is used to push this piston rod down.
As it does that, this function provides for the trans-
mission of that force into the hydraulic negative which is carried, and the resistance set up in the hydraulic cylinders in the platen forms a transfer force in proportion to the force applied. It is a very neat problem in hydraulics.

This man worked out something that no one had ever worked out before, and the Government makes no claim, as I understand it, that this particular way we did it had ever been done before, but they say that the Ferris patent shows a method of the same kind and therefore we should not have a patent.

But if your Honor will note on this Fig. 4841, on page 9, there are two members projecting out in a dome-like structure. There are some cylinders inside the platen and the piston rods—you can see some of those rods—are sticking up into those cylinders. I will have a drawing for this; I am trying to give you a general over-all picture.

When the platen comes down and engages the metal and the platen continues on down, the resistance in these cylinders carrying the platen is set up, and the press on the platen and the greater force, the greater the resistance set up in the hydraulic cylinders.

The Ferris patent, which the Commissioner relies on, which you will find in the exhibit we have put in, is a very complicated structure, and I have endeavored to sim-
22 plify the matter for the Court in a memorandum
which I will hand up, and with the Court's permission I will do so now because I am going to refer to a diagram, and I will give a copy to the Commissioner.

If you will look at page 8, the lower half of the page, you will see a diagram, the upper diagram, which represents the Ernst application. At the left hand we mention the Ernst ram which supplies fluid to a single line under pressure to 2,000 pounds of oil to move the ram and the platen which I have mentioned before, and then that oil, which is held in cylinders in the platen, is pressed so that all the hold-downs which are carried by the platen are operated by a fluid pressure generated by the platen movement. In the method claimed, that idea is brought out in language such as this, and I will read just one claim:

"4. A method of generating and utilizing hydraulic power for clamping articles being drawn comprising clamping the article by hydraulic means at its periphery with different pressures at different locations therearound, applying a drawing force to the article which so clamped, diverting a portion of the drawing force to generate hydraulic pressure during the drawing operation, and applying the pressure so generated to produce the clamping action.”

23 The principal novelty of Ernst’s contribution was to conceive the idea of the vertical drawing operation of the platen itself to generate hydraulic pressure in those cylinders during the drawing operation and thereby applying that pressure so generally to produce the action of the holddown. In other words, there is a straight line—

The Court. Do you mean the clamping action on the metal to be drawn by pressure?

Mr. Toulmin. That is right.

The Court. And the pressure at various other parts would depend upon what is being done to the metal?

Mr. Toulmin. That is right, sir. This metal is held just enough to let it slip as it is drawn down.

Therefore, the problem has always been unsolved before this invention, to hold that hold-down, because the two have to work as a team, then trying to get that between the two. Ernst hit upon the ingenious idea of only having one sort of power and not having any adjusted valve for that purpose, and then proportioning automatically the hold-down to the holding pressure.

To go back to the bottom of page 8, the lower diagram shows the Ferris patent, which is relied upon by the Commissioner, and its operation. I have another copy and may I hand this up to you?

If you will look at the first construction, and turn to Fig.
4, which is the over-all picture, you will see that that
24 is one of immense complexity. While you are looking
at that it might be helpful to look at the Patent Office drawing in the Ernst case, which I am going to explain to you in a few minutes. In the file wrapper, your Honor—I can find it for you; right at the back of the brief is an illustration.

The Court. Yes; I have it.

Mr. Toulmin. I put the two, the one of Ernst and the one of Ferris, in the back of the brief.

If you will look at Ernst and compare it just for a moment visually with the complexity of Fig. 4 of Ferris, and then turn back to the diagram, I want to call your attention to a fundamental distinction. In Ferris he uses his pump 42—at the left hand side of that figure—for two purposes. Purpose A is represented at the upper part of the diagram, moving the ram and platen by itself independently of anything else. The lower half of the diagram shows the Ferris purpose B; that is, he takes oil direct through an independent fluid line or lines, and distributes that oil to a number of independent hold-downs.

The Court. You are speaking now about that pipe line that runs out of this reservoir?

Mr. Toulmin. That is correct. So that we have in Ferris—

The Court. That is function B?

Mr. Toulmin. Function B, which is the lower part. So that we have function A and function B running parallel and not transmitting the force directly through one another as in the Ernst application.

The Court. Will you distinguish that in the Ernst diagram.

Mr. Toulmin. Yes. If you will turn back to the back of that brief, where there is a photostat of the Ernst drawing—

The Court. This one (indicating).

Mr. Toulmin. That is right. I took a photostat and drawing of each of the applications and put them in the back of the brief. If you will look at Fig. I—have you got the picture catalog before you?

The Court. Yes.

Mr. Toulmin. It helps you to see the whole picture. Let us start at the bottom again, like we did before. At the bottom 10 is the base or bed of the press. A piece of sheet metal that is going to be pressed is the metal marked 16, and I think also 15—15 being the center piece which is pressed down by a punch and 16 being the larger piece. Directly above that piece of metal there is a hold down 44.

There is a hole in the center of that hold down, which is 43, through which the punch, 41, can extend.

26 Still on the platen, 44, you will notice that this platen has two rods sticking up marked 38, that is piston rods, and you will notice chambers in the cylinders, 37, and those chambers are bored out and formed in the platen, 36. 36 you will notice on the right hand side?

The Court. Yes.

Mr. Toulmin. These form the hydraulic transfer changes which we are going to talk about in a minute. The oil is cracked in those chambers when the press operation takes place, and that transmits the force to the hold down, 44.

Still going up, the platen is connected to a rod like member, 22, which is known as the ram, and on the top of that ram is the piston, 23, and that piston and piston rod work in a big cylinder marked 20.

The Court. Is all of that apparatus in here?

Mr. Toulmin. Just above it in the head. That is the cylinder.

The Court. That is the ram here, isn't it?

Mr. Toulmin. Yes, that is correct. They make them in various ways, as you can see.

The Court. The piston in the photograph is in the area marked "HPM"?

Mr. Toulmin. That is right. The oil moving this arm is supplied from the top cylinder right at 24. You will see the numeral 24?

27 The Court. Yes.

Mr. Toulmin. That oil is supplied from the pump over to the extreme right hand, marked 30. It goes through some pipes and goes direct to the top and when the oil is at the top of the cylinder the piston, 23, the ram, 22, and the platen connected on the bottom of it, 36, move downward. As that downward movement takes place, the first thing to engage the metal is the hold-down, 44. It reaches the metal first and it, of course, comes to rest. The platen continues its movement downward.

The Court. That is, down to the pillars.

Mr. Toulmin. No, the pillars are really in front of the platen. The platen, 44, has now come down to a position I am going to mark in red pencil and hand it up to the Court, so you will understand what I mean. Would your Honor like to have a red pencil to mark your copy?

The Court. I have one.

Mr. Toulmin. The platen, 36, has continued downward, even though the hold down, 44, is engaged at work at 16 and in its lower position. The effect of this achievement is to push the piston rod, 38, into the oil chambers, 37, and press the oil in those chambers. As that oil is pressed in the chambers there is a clamping effect of the hold-down so you have a continuous straight line movement from the pump to the top of the platen and thence into the opening.

28 The throwing force that is needed by the platen to push the hold-down to the shape of the metal is, of course, proportionate to the extent to which the pump must go, and the further you push the pump down that much more power you need, and the further you push it down the greater the pressure of the oil.

That is the shrewd contribution of Ernst. Ernst therefore departs from the Ferris idea of having, as you see in Fig. 4, a vast complication of independent factors, one branch being solely used for moving the platen, and branch B is solely used for pressing the margin of the sheet metal.

The practical difficulty was—and that is the reason Ferris made no impression on the art—that you have several dozen valves to be adjusted in the Ferris mechanism in an attempt to accomplish the result which is automatically accomplished in the Ernst application, and that the conception of Ferris is wholly different in that you transfer automatically the power generated from the oil to the platen under this application.

That gives you a sort of bird's-eye view of the situation, and we will confirm this by some testimony from Dr. Greene here. I do not think the record will be very long after you have the testimony.

29 *Opening statement on behalf of the defendant.*

* * * * * * *

Mr. Reynolds. If your Honor please, as far as the law is concerned, I do not think there is any serious dispute. The statutes require that in order for an invention to be patentable it must be new and involve an invention. There is no question here as to utility. The only question is whether what is claimed here is new. It is our contention that this method is the method that is necessarily carried out in the intended operation of the Ferris patent, and that if it is not a matter exactly carried out, it certainly does not involve anything new. All we are concerned with here is the particular claims that are presented. Whether there is some invention in the device which is not brought out in the claims is not material. The plaintiff is asking the court to allow these clams and if they are to be allowed it must appear that there is something in the claims over what Ferris had done. W think that that is not so, and I think the simplest thing is to just point out briefly why we consider that claim 4 is anticipated by the Ferris patent. I believe your Honor has a copy of the Ferris patent there.

The Court. Yes.

Mr. Reynolds. I would like to refer to Fig. 1. Before doing that I might say that the claims here do not say anything about the control system. All of this elaborate system of Ferris that has been pointed out with so much horror is not brought out in the claims. They do not say how many valves or anything of that sort. 30

The Ferris press works in an opposite direction from Ernst; that is, the piston moves up and produces the blank in the die, the upper die. The upper die has a cap above the piston in Fig. 1 in Ferris, his press, in forming the article. The blank that is shown in dotted lines of 16 is just a flat piece of metal lying on the lower die across the piston, and the plunger, 17, moves up and forces that blank into the upper die. The edges of the blank are clamped during the ramming operation by the peripheral element there, 30, and the clamping pressure is applied by the pistons, 25, and also by the sylphons, as they are called, 31. That presses the blanking device up against the die and the Ferris device provides means by which he can apply different clamping pressure at different parts.

So that he has the same idea as Ernst in that respect by clamping the blank at different points of the periphery.

Referring to claim 4, it calls for a method of generating and utilizing hydraulic power for clamping articles being drawn. Ferris does say: that.

"—comprising clamping the article by hydraulic means at its periphery with different pressures at different locations."

That is done by Ferris. He describes it at page 1 of the specifications:

31 "—different clamping pressures should be applied to different points around the margin of the blank as the material flows at different rates from those points into the dies."

So he fully discloses that.

"—applying a drawing force to the article while so clamped."

That is done by the plunger, 17.

I think that there is no argument but that Ferris has disclosed everything.

And now it continues:

"—diverting a portion of the drawing force to generate hydraulic pressure during the drawing operation, and applying the pressure so generated to produce the clamping action."

Of course, he does apply hydraulic pressure to produce a clamping action.

So that there is no contention that that pressure is not produced by diverting a portion of the drawing force.

If your Honor will refer to the diagram which Mr. Toulmin has on page 8, at the bottom of the page, the Ferris

pump referred to there is described as being operated at a constant stated. If we ignore the lower branch of the line for a minute, we will have simply a flow of the liquid from the pump through the upper line marked "independent fluid line, ram and platen." That is the way that Ferris applies his force to the clamp. When he operates
32 the clamp the valves in the lower independent fluid line are open and then the fluid goes to the plungers and operates the clamp. It is our contention that this was Ferris' conception.

Obviously, if he did not take that fluid out of the line it would go on toward the main ram and piston, and instead of doing that he takes it out and engages the piston, which is just as much an operation in the ordinary sense as the particular method that the plaintiff employs.

The claims do not say anything about it being mechanical. They are drawn in the broadest sort of way. It is our contention that their claims are broad enough so that they come directly within the Ferris structure, and, moreover, if they were not broad enough, as far as those claims are concerned, it does not make any difference whether that pressure is formed by deriving it from the rams or not. The work will be done in exactly the same way. The only thing that is material is the amount of force applied. If you apply a hundred pounds to a point on the periphery, the action will be exactly the same.

There is nothing in these claims, in other words, which would make this force in any way proportioned to the force applied to the rams. They simply say that it is diverted in some way.

If there is an invention here I think it is in the particular way in which it is worked. Instead of that, the plain-
33 tiff has seen fit to draw his claims as he has.

Mr. Toulmin. For your Honor's convenience I am going to hand up a copy of the three claims.

If your Honor please, I would like to offer in evidence the deposition of Paul C. Pocock, with the exhibits mentioned which are attached at the end of the deposition, the exhibits being from 1 to 7, inclusive. It is a short deposition and shall I just summarize it or have it read or give it to your Honor.

The Court. As you desire. Why don't you do this, to summarize the deposition and then put it in evidence and have it made a part of the report of the testimony.

Mr. Toulmin. To summarize it, this is a deposition of Mr. Paul C. Pocock, Executive Vice President of the Hydraulic Press Manufacturing Company, who is in charge of sales and oversees all sales, frequently visits prospects and makes contacts with them to close the sales. The deposition sets forth that he is familiar with the subject matter involved; that his company has been making and selling this hydraulic press and that they have sold approximately three quarters of a million dollars of such equipment; that the equipment has been sold to a large number of concerns and government agencies in this country and abroad; that it has been a successful device and he outlines the commercial history of the corporation.

34 We are offering this testimony so that the court will know that this is not a paper proposition but one of substantial commercial importance. I offer the deposition in evidence.

(The deposition reads as follows:)

Thereupon **Paul C. Pocock** was duly sworn to testify the truth, the whole truth and nothing but the truth, and thereupon said Paul C. Pocock testified as follows in answer to interrogatories propounded by H. A. Toulmin, Jr.

Paul C. Pocock on direct examination by H. A. Toulmin, Jr.

Question 1. Please state your name and address. A. My name is Paul C. Pocock and my residence is Marion, Ohio, but I receive mail care of The Hydraulic Press Mfg. Co., Mount Gilead, Ohio.

Q. 2. What are the nature of your duties with that company? A. The duties that ordinarily go with a position of that kind. I oversee all sales and frequently visit prospects and make contacts with them to close sales. In this capacity I keep in close touch with all new developments being made by that company and also keep in close touch with all developments being made by The Hydraulic Press Corporation, Inc., one of the plaintiffs herein. I do this
so I can present them to prospective customers.
35 I also do engineering work in connection with my
employment with The Hydraulic Press Mfg. Co.

Q. 4. How long have you been keeping in touch with the inventions and developments of The Hydraulic Press Mfg. Co. and The Hydraulic Press Corporation, Inc.? A. I have been doing this since 1926 in connection with The Hydraulic Press Mfg. Co., and with The Hydraulic Press Corporation, Inc. since its formation in 1935, when it was incorporated.

Q. 5. Are you familiar with the invention of Walter Ernst covered by his application Ser. No. 154,365, filed in the United States Patent Office July 19, 1937, for a Method of Drawing Metal Articles, which application is involved in this suit? A. I am very familiar with that invention.

Q. 6. Has The Hydraulic Press Mfg. Co., of which you are Executive Vice-President, any connection with the invention of said Ernst application Ser. No. 154,365? A. Yes, The Hydraulic Press Mfg. Co. owns an exclusive license to practice the process set forth in said application.

Q. 7. Has The Hydraulic Press Mfg. Co. made and sold any presses which utilize the invention of said application Ser. No. 154,365? A. Yes.

Q. 8. Have these presses proved successful or un-
36 successful? A. They have proved very successful
and have been accepted by the trade over other presses.

Q. 9. To what is this success of such presses attributable? A. The invention of the Ernst application Ser. No. 154,365, herein. The presses which utilize the method of this invention have proven of great success due to the invention involved herein and have displaced prior presses which did not utilize this invention. This invention is a vital feature to the success of these presses and has increased the efficiency of the presses.

Q. 10. Can you produce any printed matter that illustrates or describes these presses? A. Yes.

Q. 11. Please produce the same. A. I produce this literature as follows:

Bulletin 3907.
"The Hydraulic Press" No. 20.
"The Hydraulic Press" No. 32, pages 1 to 7 inclusive, and
"The Hydraulic Press" No. 23, pages 2 and 3.

Q. 12. Can you produce a list of the sales by The Hydraulic Press Mfg. Co. of presses which practice the invention involved in this suit? A. Yes.

Q. 13. Please do so. A. Here is is.

37 Q. 14. What does this list show? A. Under the heading "Customer" this list gives the names of the purchasers; under the heading "Address' it gives the locations of the purchasers; under the heading "Serial No." it gives the Serial numbers of the presses sold; and under the heading "Year Ordered" it gives the years in which the presses were ordered.

Q. 15. Do all of the presses set forth on this list practice the invention involved herein? A. Yes.

Q. 16. How many presses are designated on this list? A. Forty-four.

Q. 17. Are these presses known by any name? A. Yes.

Q. 18. What is this name? A. H-P-M-Fastraverse Blankholder Presses and are used for deep metal drawing.

Q. 19. Can you state the total selling price for the forty-four presses set forth on the list which you have produced? A. Yes.

Q. 20. What is the total? A. $770,664.60.

Q. 21. How do you know that these presses sold for the price you have stated? A. I was familiar with the

38 negotiations for the sale for these presses and the selling prices given in this list of contracts totalling to this amount. Even without the contracts I know the total is substantially as given.

Counsel for plaintiffs offer in evidence the following exhibits:

Plaintiffs Exhibit 1 (Bulletin 3907).
Plaintiffs Exhibit 2 (The Hydraulic Press, No. 20).
Plaintiffs Exhibit 3 (The Hydraulic Press, No. 32, pages 1 to 7 inclusive).
Plaintiffs Exhibit 4 (The Hydraulic Press, No. 23, pages 2 and 3).
Plaintiffs Exhibit 5 (List of sales of hydraulic presses utilizing invention involved herein).
Plaintiffs Exhibit 6 (Ferris patent 1,970,134).
Plaintiffs Exhibit 7 (File wrapper Ser. No. 154,365).

(Signed) Paul C. Pocock.

* * * * * * * * * *

The Court. How much does it cost to make one of the smaller type of machines?

Mr. Toulmin. In the neighborhood of $10,000. They run all the way up to the large size of 5,000 tons, and that costs in the neighborhood of $200,000. Some idea of the size of such an apparatus can be obtained by saying a 5,000 ton press of that character would be as high as an ordinary four storey house. The castings weigh 172,000 pounds. 39

The Court. My question was with reference to the fact that presumably the deposition was to show a commercial success.

Mr. Toulmin. That is right.

The Court. And the statement was made that the amount of sales up to the present time was about three quarters of a million dollars.

Mr. Toulmin. That is right, and I suppose I can say that 90 per cent of the prices are in a range from $10,000 to $15,000.

The exhibits attached to the deposition are marked starting with No. 1. It might be confusing to use any numbers, so that we can just have the deposition copied into the record.

The Court. Very well.

Mr. Toulmin. I would like to call Dr. Greene. Will you please take the stand, doctor?
Whereupon,

Dr. Arthur M. Greene, Jr., was called as a witness for and on behalf of the plaintiff, and having been first duly sworn, was examined and testified as follows:

Direct Examination

By Mr. Toulmin:

Q. Have you stated your name? A. Arthur M. Greene, Jr.

Q. And your occupation? A. I am a mechanical engineer and educator.

Q. Will you give us a very brief statement of your qualifications to testify in matters connected with this case? A. I began my university work in 1895 at the University of Pennsylvania as an instructor in mechanical engineering, and after this I was called to become the professor of Mechanical Engineering at the University of Missouri. That occurred in 1902.

In 1907 I was called to the Rensselaer Polytechnic Institute to inaugurate their new course in mechanical engineering. I remained there until 1922, at which time I was called to Princeton to become Dean of the School of Engineering and a professor in mechanical engineering.

As professor of mechanical engineering I have taught the subjects of machinery design, mechanism, hydraulics—which are pertinent to this present cause—in addition to heat and thermodynamics which are not important here—and I have also written a book on pumping machinery.

During my residence in Philadelphia, I was a member of the committee of the Science and Arts of the Franklin Institute, and as such member I was called upon to examine meritorious inventions for awards by the Institute. I am at present an honor member of the American Institute of Mechanical Engineering and a Fellow of the American Association for the Advancement of Science.

41 For over a quarter of a century I have served as an expert in mechanical engineering and hydraulic subjects in various patent causes.

Q. Have you had occasion to study the Ernst application now in issue here, Serial No. 154,365, as set forth in the exhibit file wrapper? A. I have.

Mr. Toulmin. May it please the Court, that file wrapper is in evidence as Exhibit No. 7.

By Mr. Toulmin:

Q. Have you also examined the Ferris patent, No. 1,970,134, which is in evidence here as Plaintiff's Exhibit No. 6? A. I have.

Q. And have you examined with particularity the Examiner's statement and the opinion of the Board of Appeals in the Ernst application? A. I have.

Q. Will you turn to the Ernst patent application and give a brief statement referring to the drawings of your understanding of the mechanism and method of operation of that disclosure in the Ernst application? A. May it please the Court, I would like to utilize the figure 1 attached to the plaintiff's brief and also, if I might to refer to figure 1 of the application of Ernst and in addition the half-tone No. 5234 to which I believe the attorney for
42 the plaintiff referred.

The drawing, diagram 1, is a diagrammatic rep-
of the figure on page 7 represents this surge tank, so-called,
resentation of the press, platen and rable and the very top

at the top of figure 1. Within the surge tank is the cylinder, 20, which has within it a piston, 23, and plunger, 22, and to the plunger is attached the platen, 36. In the half-tone the Court will readily see the large plunger just above the platen on which the name plate is marked and the cylinder, 20, is within the top framing of this press. The bolts which are shown in Fig. 1 as 12, with nut, 13, are encased within the side covering of the press but the nuts can be seen at the bottom of the table. They are represented in the picture by 13.

Below the platen to which the name plate is attached you will see a plate extending across the opening, which is the same as plate 44 of Fig. 1, and then on the top of that you will note four round pistons which are the parts marked 38 of Fig. 1. In the small pictures to the side of this large one on page 7 you will find at the top of the press the pumping apparatus which supplies the hydraulic power to operate the press and produce the drawing force.

I wonder if the Court would like me to say anything more about this or is this clear to you, because the diagram is a little bit difficult to follow because it has been simplified for patent purposes.

43 The Court. Mr. Toulmin explained it rather well.

A. (Continuing) In this Fig. 1 at 30 is the pump, which is constantly drawing in fluid by 32, forcing the fluid upward by a pipe, 39. There is a four-way valve, 28. Let us suppose that we have the four-way valve so moved that oil is driven up through the pipe, 26. This oil then will go on top of the piston, 23 and the space, 21, and force the piston, the plunger, 22, and the platen, 36, downwards. The oil, which is in the annular space around 22 passes out through the pipe, 26, through the valve, 28, and the pipe 21 to the surge chamber, and then through the pipe, 32, which is the suction pipe of the pump, 30. So that at this time the pipe, 27, is part of a suction system taking the oil from beneath the piston, 23, in the annular space around the plunger and delivering it to the pump through the surge tank.

As Mr. Toulmin pointed out, at this time the platen and the holder-down, 44, will strike the material which has previously been formed, No. 16, by a press operation; as soon as the downward motion of 44 is prevented by contacting with this piece (illustrating), the plungers, 38, are forced inward.

Oil is not very compressive. You can compress it a slight amount, but the pressure, due to a very slight extension of these piston rods into the cylinders, 37, will cause a rising pressure, and of course that rising pressure producing a pressure on the hold down to restrain the part, 16,
44 as the drawing point, 41, finally comes in contact with 16.

The Court. That is not intended for punching?

The Witness. No, that is not intended for punching in this case. We attempt to draw 16, which is now a hemisphere, into an elongated cartridge case, you might say, and the part, 18, which is not mentioned completely merely is used at the end of the operation to eject the drawn part, if necessary.

At this point of downward motion, when the part 27 is an exhaust pipe, there can be no excessive pressure in the pipe 47 which would pass the valves 48 over to the cylinders, 37. Those check valves open in that direction but only when there is a small pressure or a lower pressure within the cylinder.

As I have explained, the first action of compression here is to raise the pressure a considerable amount, in fact until very soon, almost immediately, it will be raised to such a pressure that the check valve, 51, over on the extreme left, opens to allow the oil to discharge up through 55 into the surge tank. The designer and the operator however the machine has been designed, can set the valve, 51, to give him the desired pressure within the specific cylinder, 37, to which this valve is attached. If the valve becomes inoperative or jams, the inventor in his application shows the safety valve, 50, at the bottom, which is set for a

45 higher pressure and, of course, will give. This force generally on the piston rod, 23, by the hydraulic pressure from the pump, 30, is designated by the applicant as a drawing force, because the force from this oil pressure is utilized to produce the drawing.

In his disclosure in this application he uses part of that total force which he entitles the drawing force to apply to the platen and produce the hydraulic pressure within the cylinders 37, which in turn produce pressure downwards, and in this application the inventor has endeavored to describe the way in which the pump power can be applied to the main piston to produce drawing pressure, as it would be called normally, but part of this is delivered through the platen to the other cylinders.

After the drawing has been completed the four-way valve 28 is now moved so that 27 becomes a discharge pipe from the pipe 29 and 26 becomes a pipe of discharge. At that time the pressure within the annular space is increased and the pistons with the platen start to rise. That immediately reduces the pressure within the parts 37, a slight meeting enough however to allow the light pressure which is now leaving the device to enter through the pipe 47 and the check valves, 46, entering in the cylinders 37, to push downward on the pistons, 38, to maintain pressure at this time.

It is also to be noted that, although the oil presses
46 downward on the pistons, it presses up on the cylin-
der and adds accellerating force to the retraction of
the platen, plunger and piston.

I think that covers it.

By Mr. Toulmin:

Q. I would like to have you particularly point out to the court, in the method of this Ernst application, where you find this:

"—diverting a portion of the drawing force to generate hydraulic pressure during the drawing operation, and applying the pressure so generated to produce the clamping action.''

A. As I have stated, the drawing force, which is that which would produce motion, the force is not fluid, it is not the pressure of the fluid, but it is the effect of that pressure on the piston, 23, and the drawing force at any instant is equal to the pressure in the space, 21, per square inch times the area of the piston, 23. This is assuming that there is zero pressure, or practically zero pressure, in the annular space. That total force—it is no longer pressure, it is no longer fluid, but it is force—which is transmitted down through the plunger, 22, into the platen—remember the going down to 41, a part of it, of course, being resisted or supported or divided in the cylinders which gives hydraulic pressure in there—the hydraulic pressure did not exist before, which hydraulic pressure is applied to the pistons to hold the frames 44 against the work. 47

Q. And that is the way in which the drawing force generates the hydraulic pressure for the hold-down action? A. Absolutely, and, of course, before the drawing force is exerted, when the holding down frame, 44, comes in contact with the work, before the platen is advanced sufficiently to introduce the drawing point, then all of the pressure exerted is forced down on that frame, and of course you must realize that the instantaneous pressure of the oil is responsive to the action that is taking place. If there is very little resistance to the use of that oil then the pressure is low, but as soon as you attempt to stop the motion then the pump which is moving on produces the rising pressure.

Mr. Toulmin. Let the record show that what I read was from the end of claim 4.

By Mr. Toulmin:

Q. Dr. Greene, will you point out that feature or those features which are represented in the Ernst method described as follows:

"—applying a drawing force to the article while so clamped, diverting a portion of the drawing force to generate hydraulic pressure, during the drawing operation, and applying the pressure so generated to produce the clamping action and release the excess pressure at a predetermined maximum."

You need not repeat your previous answer but
48 devote yourself to any additional remarks you wish to make.

A. The elements which you have mentioned, or the features which you have mentioned, in this method, have been described in answering the previous question, with the exception that the check valve or the release valve, 51, can be set at a predetermined pressure and independently for each of the cylinders, and usually there are four. So that when the pressure is reached in any one of the cylinders the release valve will rise and the discharge will occur through 53 and 55 into the surge chamber.

Q. Let the record show that I have quoted from the end of claim 5.

Doctor Greene, will you point out how the following portions of the method of Ernst are performed, namely:

"—diverting a portion of the drawing force to generate hydraulic pressure during the drawing operation, applying the pressure so generated to assist the clamping action, applying a retracting force to the member appying the drawing force, diverting a portion of the retracting force to generate pressure and applying the pressure thus generated to maintain the clamping pressure under the retraction."

A. In my general description I have said what happens during retraction, as shown in Fig. 1. The drawing force, the clamping force, and the clamping frame have already been described. To describe in better words, how-
49 ever, the expressions, which you have quoted to me, I would like to refer to Fig. 3 of the patent.

Q. Of the Ernst patent? A. Which is in the file wrapper, and if you have a copy there I might use that for his Honor's enlightenment. This Fig. 3 is one of the modifications in the application, and it has the pump, 30, the four-way valve, 28, the surge tank, 19, the piston, 23, the plunger, 22, and the platen, 37.

The Court will note, however, that there is no passage through the center of the plunger in this arrangement, but oil can enter through the check valve, 94, whenever there is a reduction in pressure. If the pump is arranged so that, on a discharge through 27 into the annular space and the plunger and piston move upward, then the plunger, 88, on this figure also rises and produces pressure on the oil above it. This is transmitted downward into the cylinder below and produces force on the piston, 38, so that in this manner we have a force tending to elevate the platen. It is, of course, exerted by the oil within the annular space. Part of that force, however, is taken by the oil within the cylinders, 92, and as the projection moves upward the oil pressure is trying to hold it down, so that part of this retracting force is utilized to produce the pressure, and if there is a flow of oil downward it means that there must be an increase of pressure and that the platen finally presses down on the frame.

50 Q. Dr. Greene, I wish you would turn to the question of the Board of Appeals opinion in this file wrapper of the Ernst application and point out what, if any, mistakes of fact have been made in the statements in that opinion, if you can do so.

The Court. I think at this time we might take a five minute recess.

(Whereupon a short recess was taken.)

51 Mr. Toulmin: Your Honor will recall we were

The Court: Yes.

about to discuss the Board of Appeals' opinion.

The Witness: The copy of the opinion of the Board of Appeals is given in the file wrapper, your Honor, and on page 2 of that opinion I find, in the second paragraph, that the Board does not refer to the number of pipes 80. There are four of these which I feel should have been mentioned, and then he refers to pipe 104, which in the—

The Court: I don't find that.

Mr. Toulmin: Just a minute, Doctor. You are now referring to Ferris?

The Court: I beg your pardon.

The Witness: I called that the second. I should have said the first one given on that page. Excuse me, sir.

You will find on figure 5 of the Ferris patent the pipe 104, which is really fed from the cylinder 24, they are A, B, C and D, through this valve 105, and then from that line 104 there are six pipes 107, having a choke 108, sylphon bellows 109, each of them with those relief valves 110. This statement, as made by the Board, is not so complicated as the real disclosure of the patent.

Now, having reference to the application, he said that "The pump 30 forces liquid into the cylinder 20 to elevate—" We quote this—"to elevate the piston 23, and also through the passage 47 to the cylinders 37 dur-
52 ing retracting movement of the die plunger 41."

Now, that is true with reference to figure 1, but no mention has been made as to figure 3 which we looked at just before the recess, which had no opening up through the plunger. When this retraction occurs here (indicating) there is no passage 47 whatsoever. That is, on figure 1 the statement is true. However, no reference is made to figure 3 in their opinion.

The Court: There is, as a matter of fact, that angular passage through that one (indicating).

The Witness: No, sir, not in this one. That little which we have enters through the surge tank. Figure 3 is a modification of the patent, but in this one there is no passage 47 through the cylinder.

The Court: There is the modification?

Mr. Toulmin: May I say that they are claiming on that a modification of figure 3—

The Court (interposing): Let me get this straight in my mind, these machines, as manufactured, is there a passage such as is described here?

The Witness: If it is of this type.

Mr. Toulmin: I think I can answer your Honor's question; there are two types, your Honor, and we are showing you now some illustrations of each type.

53 The Witness: On page 7 of the deposition, No. 32 Exhibit, that is similar, in my opinion, to figure 1. I think the other one, which is figure 4841 on page 9 of Plaintiff's Exhibit No. 2, called the hydraulic press No. 20, I think in that one we are following figure 3.

In the second paragraph on this page, your Honor, the Board states that the "applicant attempts to distinguish from the patent by stating that a diverted portion of the drawing force is utilized to generate the fluid pressure in the cylinder 37. While this pressure results from downward movement of the piston 23 and head 36, it is not transmitted through the drawing plunger 41."

Now, there is nothing in the application which is mentioned on the Ferris patent. There is nothing in the application which states that the hydraulic pressure generated within these cylinders is due to the force 41. It speaks of the drawing force, meaning the force on the piston head, and in the opinion of the Examiner, dated November 21, 1939, paper No. 11, the Examiner states: "The transmission of a part of the force applied to the piston 23, to the clamping pistons is defined in the claims as 'diverting a portion of the drawing force to generate pressure fluid—to assist the clamping action.' "

Now, to understand perfectly the feature which Ernst is covering in his application, namely, to take part of the force generated on the piston and produced from it—by part of it, not all of it—this pressure, which we will

54 see later is not even thought of in the Ferris disclosure.

Further on, at the end of that paragraph, the Board states: "This pressure is created by fluid coming from the pump through the passages 27 and 47, the valves 51 at that time being held closed by pressure developed through the passages 56."

Now, this pressure, in my opinion, refers to the pressure we have been discussing, and the Board has been misled by the statement of the Examiner beginning on page 2 of the paper No. 11, and the Examiner states there: "As the platen 36 continues its downward movement pressure builds up in the individual clamping cylinders (due to the exhaust from the lower side of the piston 23 into the cylinders 37, and also to the relative movement of the pistons 38 and cylinders 37) until the pressure is reached in each cylinder for which its respective pressure release valve has been set."

Now, may it please the Court, the statement made by the Examiner here in brackets is the thing which has misled the Board. He says "As the platen 36 continues its downward movement pressure builds up," and then in brackets "due to the exhaust from the lower side of the piston 23 into the cylinders 37, and also to the relative movement of the pistons 38 and cylinders 37."

Now, during that time the pressure is on top and there is really a discharge period underneath. It is in that section and, therefore, it could not possibly overcome the 55 pressure from these cylinders against the choke valve, and I think the Board has erred in making that statement.

Now, on the last page they state, "The references to diversion tend to confuse, rather than clarify. In any event, they refer to manipulative steps of the apparatus which are without importance in defining the acts performed on the work."

The diversion of force, drawing force, in order to produce a clamping action and eliminate the great number of devices needed by Ferris to do clamping, and to have this clamping properly synchronized with the other motions of the pump due to this diversion is not merely manipulative but, to me, is something which is new and useful.

I believe, Mr. Toulmin, that covers the points which I had marked.

By Mr. Toulmin:

Q. Let me ask you one more question: The Board stated, near the end of page 2— A. (interposing) Of the Board's report?

Q. Yes, where the Board says, "This pressure is created by fluid coming from the pump through the passages 27 and 47, the valves 51 at that time being held closed by pressure developed through the passages 56."

At the time that the Board referred to, is it not a fact that the valves 46 in those lines must be closed in order
56 to have the press operate? In other words, Dr. Greene, would it be possible for the fluid to flow, as the Board points out, when those two valves are in the line and are closed under pressure? A. Oh, no, but I believe I have discussed this point.

Q. I think you have. A. Because I think the Board was misled by the little bracket portion, and no flow could take place when the piston 23 is being moved down by the operation of pressure on top, and at that time the valves 46 have to be closed, that is, in my opinion.

Q. Now, Dr. Greene, I wish you would turn to the Ferris patent and give a general desciption of it before I ask you some details about it. A. Has the Court got the Ferris patent?

The patent 1970134 to Walter Ferris is for a hydraulic press, and it is for that press that this—to that press that this disclosure relates.

If your Honor will turn to figure 1, as has been explained by Mr. Reynolds, the force of drawing plunger 17 is below in this case and operates a die 15 upward into the upper die in the plate 7. The material to be drawn in this case is indi-

cated by the dotted line 16, and a cap 30 rests on a frame 22 in which there is a groove extending completely around, and is marked 29 on the figure. In this groove are arranged sylphon bellows. The sylphon bellows is a device
57 which gives flexibility, and at the same time it becomes fluid here (indicating).

Below the die-block 22 are a series of pistons 24 A, B, C and D. These lower pistons 24 A to D are raised by liquid under pressure, which may enter through the pipes 80 A, B, C, and D, and also by pressure which can come up through the pipes 62, which are beneath, and also pistons 27 A to 27 D. Now, through the upper pistons you will note the dotted line which enters pipe 104 at the top. There is one of these for each one of the pistons, and the diagramatical arrangement of this is shown on figure 4, without, however, the sylphon bellows, which come in figure 5 on the next page, showing that this complicated arrangement cannot all be referred to in one figure.

Now, in the figure 4, in the middle of the figure is the piston 17 with its lower retracting piston 20 on it. Then in the diagram are the four pistons which move the cover. The picture also shows the line 104 connected into each of the cylinders 25 A to D by an opening over valve 105. There are four of those valves 105, and the operator must select the proper one for the operation at any given time.

Now, just to turn over for one moment to figure 5, we again see line 104 with the four valves 105, and then running from that line are the six pipes 107 which supply the sylphon bellows marked 31 through a thread 108, and in parallel with these sylphon bellows is a relief valve 110, so that we can control the pressure in any one of
58 these six (indicating). Back on figure 4 we see that in each one of the cylinders 25 there is a relief valve marked 103 A, B, C and D.

Now, your Honor, in this device Mr. Ferris speaks in his claim of having one sort of fluid; he calls it pressure fluid, and that is in figure 4; that is the pump 42 which is always acting in one direction, discharging upward toward the pipe 45, and drawing from reservoir 44, which is beneath the pump.

43 represents the motor and, of course, that supplies the energy for the pump, and the pump supplies hydraulic energy through oil under pressure and this, of course, is expensive; that is, you cannot run an electric generator to produce pressure if you are going to throw that liquid away by passage through some resistance.

Now, in that picture the whole device is inoperative, and the valve down at the bottom, that complicated valve, is one which should be brought out as to operation, the pressure beneath on the Ferris claim, for instance, 24 A to D. When that opens liquid may escape through one of the valves 105 into the line 104, and then into the various sylphon bellows. After that is done then the operator must work on the valve directly over the pump which causes liquid to flow into cylinder 18 at the middle, which is the drawing cylinder. Now, your Honor can clearly see that should the man, by mistake, in a hurry, move the valve by handle 58 instead of the one at the bottom, trouble
59 may occur. Moreover, if he operates the one at the bottom, 93, and waits an extra time, that all means loss through the various relief valves 103, and the other relief valves 91-B, which are working, and the six additional relief valves 110, shown in figure 5.

The specifications I am not going to bother you with unless you desire me to, but on page 4, starting in at line 22, it is said that you must first put the valve shown on figure 4, the long one, in the position which is shown in figure 8. Then after you do that you have got to go to figure 9 on the next page. After you do that you have got to move into position figure 6, and then you go back into position—no, before you go back to that you go to position 10, which is used to produce the full pressure on the drawing rab.

By the Court:

Q. Doesn't this matter all come down fundamentally to the proposition of hydraulic power through pressure applied, as the petitioner claims, in the Ferris patent, by two pumps? A. One pump at a time, but in a different way, yes.

Q. And in this claim here you have the same function in one way, but in a more economical way? A. Yes, but not just the same methods.

The Court: But both are pressures achieving the same result?

Mr. Toulmin: Yes, but this particular method, which we say is better, is the one we are after. It boils
60 down to that. I am just about to ask Dr. Greene, if I may, a couple of questions to crystallize these things.

By Mr. Toulmin:

Q. Dr. Greene, in this Ferris patent do you find these steps, "diverting a portion of the drawing force to generate hydraulic pressure during the drawing operation"? A. I do not. It is not even indicated.

Q. Now, will you tell the Court why it isn't in the Ferris? A. In the Ferris patent the drawing force is exerted by the pistons 17 and 20 acting on the die 15, and none of this force in any way gets into the clamp, the clamp is absolutely free.

Q. You are now referring to the Ferris patent? A. I beg pardon?

Q. You are now referring to the Ferris patent? A. The Ferris patent.

The Court: Figure 1?

The Witness: Yes, sir, the fluid under pressure from the pump is supplied beneath the piston 17 and piston 20 to produce the final maximum drawing pressure applied through these parts to the die 15, and this is entirely free (indicating).

Moreover, if you go back to the figure 4 and trace out the pipes, you will find that there is a deviation quite similar to that indicated in the operation we have here
61 on page 8. In fact, this figure on page 8 is an exact

representation of what we have in Ferris minus the numerous valves and complications.

By Mr. Toulmin:

Q. Now, in Ferris do you use the platen, and the force on the platen, for generating any fluid pressure? A. We do not.

Q. In Ernst do you use the force on the platen for generating hydraulic pressure? A. In Ernst, yes, we do. In Ernst the force on the platen, which we call drawing force, not only presses the drawing head in, but at the same time produces hydraulic pressure that reacts on the plunger to do the clamping.

Q. Now, Dr. Greene, I wish you would tell the Court, if you can, what is the practical advantage, if any, of the Ernst construction by which the forces on the fluid is used to generate hydraulic pressure to operate on the hold-down clamp? A. The principal advantage, your Honor, is the utilization of merely that hydraulic power needed to produce the clamping and at the same time the drawing. There is no leakage of oil under pressure, which means loss of energy. There is no loss of time in this device. As soon as the fluid moves downward you have the plunger force into the cylinders, and as soon as the desired pressure is reached there is no further force required. That is absolutely different from the disclosure of Ferris where
62 all of the clamping fluid is under the full pressure of
that needed to operate the drawing plunger.

Q. And does the fluid in Ernst supplied by the pump go direct to the hold-down? A. Oh, yes, it goes direct to the hold-down; it is essential.

Q. In the Ferris you have the operation 15-A of supplying fluid direct from the pump to the platen, is that correct? **A. In Ferris?**

Q. Yes. A. Yes, sir.

Q. And in Ferris you have a separate source, or rather a separate supply of liquid from the pump direct to the hold-down, is that right? A. Yes, sir.

Q. Now, in Ernst do you have independent hydraulic supply to the platen and to the hold-down, or do you have only one supply? A. You have only one supply which goes to the platen, and as to the hold-down frame, meaning the material to be held, there is no hydraulic pressure appreciable within that cylinder. The hydraulic pressure which does the clamping is produced by the movement of the platen after that occurs, but none of that pressure comes from the pump whatsoever.

You are now referring to Ernst? A. I am now
63 referring to Ernst.

Mr. Toulmin: That is all. You may have the witness.

Cross Examination.

By Mr. Reynolds:

Q. Will you explain just what you mean by drawing force? A. Drawing force?

Q. Yes, sir. A. The drawing force, as described in this application specification, refers to that force which is applied to the platen by means of plunger 22.

Q. Now, is the pressure of the fluid on top of that piston a part of the drawing force? A. I beg your pardon?

Q. Is the pressure of the fluid on top of that piston a part of the drawing force? A. Pressure as pressure is not. The summation of that pressure times the area produces the force. The intensity of pressure is not the force, in my opinion. The fluid is not the force in my opinion by any means.

I note in your description you have spoken about the fluid as the force, and I have looked through Mr. Ferris' specifications and I find no statement of that. He speaks of hydraulic pressure from fluid, but in no case does he refer to it as the force.

Q. But if you took the fluid out the force would disappear, wouldn't it? A. And I think it you should
64 break an electric circuit the power would disappear.

Q. Now, isn't there a continuous acting of the force coming from the head of the pump clear down to the head of the die? A. Will you say that again?

Q. Isn't there a continuous acting of the force coming from the head of the pump clear down to the head of the die? A. There is hydraulic pressure.

Q. That is force, isn't it? A. No, hydraulic pressure isn't a force. It is intensity of a force exerted on a square inch, and unless it can produce motion, or tend to produce motion, I wouldn't call it a force.

Q. What is force, a summation of all these things? A. If I were asked to describe force I would say it would be the product of the area and the intensity of pressure. It is pressure from 2000 pounds per square inch, and if the area is 100 square inches that would give you 200,000 pounds pressure down which I would designate as the force.

Q. Now, what you have just referred to as the drawing force never actually reaches the drawing tool, does it? A. No.

Q. So what you mean by force is a force created
65 somewhere which in time gets to the drawing tool?
A. This applicant uses that expression, and in his
application he designates, as the Examiner has designated,
that he has designated this thing as drawing force.

Q. But you do not consider that the pump exerted any drawing force? A. Oh, no, their pump is not a drawing force.

Q. But if you stop the pump the force would cease? A. Oh, yes, and if you stop the motor the force would cease.

Q. When you divert fluid from the outlet line of the pump you lessen the drawing force, don't you? A. When you what?

Q. When you divert fluid from the outlet line of the pump you lessen the drawing force, don't you? A. No, not at all, because the intensity that is adjusted—I am very glad you asked the question because it shows the confusion in your mind. The intensity is the same in each of those lines.

Q. You mean you can break the outlet line of the pump without lessening the drawing force? A. No, you will have to divert part of it.

Q. Please answer the question. A. What is the question?

Mr. Reynolds: Read the question.

The Reporter (reading):

66 "Question: You mean you can break the outlet line of the pump without lessening the drawing force?"

The Witness: Oh, you would interfere with it entirely.

By Mr. Reynolds:

Q. Then if you divert liquid from that part you lessen the force? A. No, if you divert liquid in parallel, as the operation has shown here so nicely; in the ordinary electric light here we have 110 volts in parallel, and if you turn off any single one of these lights you won't change the voltage perceptibly, and so here if you take off oil in one of those side lines, and your pump pressure is the same, 2,000 pounds, the fact that you have opened up your independent fluid line will have nothing to do with the pressure.

Q. But if the pump is operated at a constant speed— A. (interposing) No, I beg pardon, most of these pumps have an adjustment on them.

Q. You said you were familiar with the Ferris patent, didn't you? A. Which one?

Q. The Ferris patent? A. Yes.

Q. Doesn't he say the pump operates at constant speed? A. I will look.

Q. I will call your attention to page 2, second column, first complete paragraph of the Ferris patent. A.
67 Page 2?

Q. Page 2, second column, first complete paragraph. A. Page 2?

Q. Page 2, second column. A. What line?

Q. Beginning with line 3. A. Ferris?

Q. Yes. A. Page 2? That isn't line 2.

Q. I mean line 3. A. We always use the numbers which are given by the Patent Office. This is a specification of a positive displacement pump 42 which is driven at a constant speed by an electric motor 43, and delivers liquid from reservoir 44 into a supply pipe 45 having three branches having liquid to pump, and which is employed and described in patent 1789198. Now, unless I have seen that patent I am not sure that that is not one of Mr. Ferris' patents which has an internal arrangement by which the pressure can change and the discharge can change.

Q. Now, if you have a pump driven at a constant speed, and if you open the outlet into the supply line the pressure is going to drop, isn't it? A. For a very short time, and then, because oil is practically non-compressible, it will rise again to that established by the pump.

68 Q. But as soon as you open the line the pressure will drop? A. Yes, but there must be this said, as long as we are quibbling we had better quibble; it all depends on the speed as to which the various valves are moved as to whether the pressure will fall appreciably. The pressure does fall in certain hold-downs, that is correct.

Q. And, therefore, the drawing force is lessened at that time? A. If the drawing has started, but the drawing doesn't exist until you have all of your clamps working.

Q. But the drawing force is there? A. No, the drawing force doesn't exist until you move the handle on No. 58; that is this operation supplies all of the hold-downs if you work it properly, of course, if you do as you suggested you may have this operation and spook all your work, but you must adjust all of your hold-down pistons and sylphons before you apply your drawing force.

Q. And that is true in Ernst, isn't it? A. No, the Ernst starts the hold-down as the plunger is going down.

Q. But you are applying the clamping force? A. Yes, but not with the pump, however, but by part of this so-called drawing force.

69 Q. You are familiar with the claims involved here, are you? A. I beg your pardon?

Q. You are familiar with the claims involved here, are you? A. The three claims?

Q. Yes. A. Yes.

Q. Do any of them say anything about a force that is applied by the pump as the clamping force? A. It says that the clamping force is supplied by hydraulic pressure which is built up by diversion of part of the drawing force.

Q. Now, there is no actual diversion of force there, is there, from the drawing member? A. Yes.

Q. Will you explain how the force gets to the— A. (interposing) Oh, you mean the drawing head?

Q. Yes. A. Yes.

Q. So what you mean that there is a diversion of drawing force is that some of it will be diverted to the clamps, is that right? A. That is right.

Q. Isn't that true in Ferris, too? A. No, this device of having a synchronized rab, a force without killing,
70 without spoiling the motion, is a great contribution.

Q. That may be, but we are talking about the claims. What is the claim that brings that out? A. The claim gives you the main idea of Mr. Ernst, namely, to utilize force produced by a single pump on a single piston which is drawing eventually—

Q. (interposing) These claims don't say anything about force on the piston, do they? A. The claims are to cover that combined invention; I don't know, there are no words there about pistons, you can read the words, but they are there.

Q. Now, you referred to the machines that are pictured on this Exhibit 1 as being of certain types; do you have any personal knowledge of those machines? A. No, not to those I referred to; I have of a great number of hydraulic press company machines, especially those down at the Navy Yard here, but I don't know about those two machines.

Q. Now, does it make any difference so far as the actual drawing operation is concerned what the source of the pressure applied to the clamp is? A. I think not. I think that is entirely a matter of the amount of pressure you arrange at the periphery.

Mr. Reynolds: That is all.

71 Mr. Toulmin: That is all.

(Witness excused.)

Mr. Reynolds: I would like to introduce this as Defendant's Exhibit No. 1.

(Thereupon the following document was marked "Government Exhibit No. 1.")

"THE HYDRAULIC PRESS CORP., INC. et al.v. COE

Civil Action No. 7743.

A—Ferris,	1,970,134
B—Print of Drawings,	
C—Statement of the Examiner,	
D—Decision of the Board of Appeals."	

The Court: Has the defendant rested?

Mr. Reynolds: Yes.

The Court: Do counsel desire to argue?

Mr. Toulmin: I would suggest it unless your Honor doesn't wish it.

Mr. Reynolds: I would like to have permission to file a brief.

The Court: I think, unless counsel for the petitioner objects, that will be followed. It will be very helpful. If you care to file any additional brief you may do so.

Mr. Reynolds: How soon does your Honor want it filed?

72 The Court: I have two patent cases under advisement, and you may draw from that the inference it might be a couple of weeks.

(Thereupon at 12:30 o'clock p. m. the instant hearing was concluded.)

* * * * * * *

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Findings of Fact

1. This is an action under Section 4915 of the Revised Statutes (U.S.C., title 35, sec. 63) in which it was sought to have the Court find that the plaintiffs, The Hydraulic Press Corporation, Inc., and Walter Ernst, are entitled to receive a patent containing claims 4, 5 and 7 of the Ernst application No. 154,365.

2. The Ernst application here involved discloses an hydraulic press for forming sheet metal in which the metal to be shaped is clamped at its periphery while the central portion is forced into a die cavity by means of a plunger. The plunger is actuated by an hydraulically operated piston and the clamping pressure is applied by means of auxiliary pistons which move in cylinders formed in a block at one end of the main piston. The arrangement is such that as the main piston moves the drawing plunger toward the work it also serves to generate hydraulic pressure in the cylinders containing the clamping pistons.

3. The Ferris patent No. 1,970,134 discloses a press
75 in which a sheet of metal is clamped at its margin
while the central portion is forced into a cavity by means of an hydraulically actuated plunger. The liquid for actuating the plunger is supplied by a pump which, the patent states, is driven at a constant speed. The same pump also supplies liquid to the hydraulically actuated mechanism which clamps the periphery of the sheet during the drawing operation. The clamping means may be adjusted to provide different pressures at different portions of the periphery. The means for effecting this adjustment comprises adjustable relief valves for releasing pressure fluid at different points on the periphery when predetermined pressures are attained.

4. In the Ferris system the clamps are actuated by liquid which is diverted from the supply line of the main plunger, and this involves a diversion of the drawing force within the meaning of claims 4, 5 and 7 of the Ernst application here involved.

5. It would not require invention to continue the supply of liquid to the clamping means of Ferris during the retraction of the main plunger.

6. Claims 4, 5 and 7 of Ernst application No. 154,365 define no invention over the system disclosed by Ferris patent No. 1,970, 134.

76 *Conclusions of Law*

1. Claims 4, 5 and 7 of the Ernst application here involved are unpatentable in view of Ferris patent No. 1,970,134.

2. Plaintiffs are not entitled to a patent containing any of claims 4, 5 and 7 of the Ernst application here involved.

3. The Bill of Complaint should be dismissed as to all the claims involved.

MATTHEW F. McGUIRE,
Justice.

77 *Judgment*

This cause having come on to be heard and having been tried in open court and argued by counsel for the respective parties upon the pleadings and proofs adduced and submitted to the Court,

It is ADJUDGED this 9th day of January 1942, that the complaint in this case be, and the same hereby is dismissed with costs against the plaintiffs.

MATTHEW F. McGUIRE,
Justice.

APPROVED AS TO FORM:

....
Attorney for Plaintiffs.

UNITED STATES
COURT OF APPEALS FOR THE
DISTRICT OF COLUMBIA

FILED MAY 20 1942

Joseph W. Stewart
CLERK

BRIEF FOR APPELLEE

In the United States Court of Appeals for the District of Columbia

APPEAL NO. 8210

THE HYDRAULIC PRESS CORPORATION, INC., AND WALTER ERNST, APPELLANTS

v.

CONWAY P. COE, COMMISSIONER OF PATENTS, APPELLEE

APPEAL FROM THE JUDGMENT OF THE DISTRICT COURT OF THE UNITED STATES FOR THE DISTRICT OF COLUMBIA

W. W. COCHRAN,
Solicitor, U. S. Patent Office,
Attorney for Appellee.

E. L. REYNOLDS,
of Counsel.

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460119—42

In the United States Court of Appeals for the District of Columbia

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APPEAL No. 8210

THE HYDRAULIC PRESS CORPORATION, INC., AND WALTER
ERNST, APPELLANTS

v.

CONWAY P. COE, COMMISSIONER OF PATENTS, APPELLEE

APPEAL FROM THE JUDGMENT OF THE DISTRICT COURT OF THE UNITED STATES FOR THE DISTRICT OF COLUMBIA

BRIEF FOR THE COMMISSIONER OF PATENTS

INTRODUCTION

This is an appeal from the judgment of the District Court of the United States or the District o Columbia (App. 133)* dismissing appellants' complaint brought under Section 4915 R. S. (U. S. C. Title 35, Sec. 63) to authorize the Commissioner of Patents to issue to appellants a patent containing claims 4, 5, and 7 of the application of the appellant, Walter Ernst, Serial No. 154,365.

THE ERNST APPLICATION

The structure disclosed in the Ernst application (App. 11) is an hydraulic press for forming sheet metal in which the metal to be shaped is clamped at its periphery while its central portion is forced into a die cavity by means of a plunger. The plunger is actuated by an hydraulically operated piston and the clamping pressure is applied by means of auxiliary pistons which move in cylinders formed in a block at one end of the main piston. The arrangement is such that as the main piston moves the drawing plunger toward the work, it also serves to generate hydraulic pressure in the cylinders containing the clamping pistons.

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*The numbers in parentheses refer to pages in appellants' appendix.

THE FERRIS PATENT

The sole reference relied on is the patent to Ferris, No. 1,970,134 (App. 83) which discloses an hydraulic press which is generally similar in operation to that of Ernst. In the Ferris press, however, the clamping pressure is applied by means of sylphons which are actuated by the pressure of fluid taken from the outlet line of the same pump which supplies fluid to the main plunger of the press itself.

THE APPEALED CLAIMS

The appealed claims are found on pages 4 and 5 of appellants' appendix.

SUMMARY OF ARGUMENT

1. The term "drawing force," used in the appealed claims, means the force applied to the piston which actuates the drawing tool.
2. In the Ferris structure, the diversion of pressure fluid from the line which supplies the piston which actuates the drawing tool constitutes a diversion of the drawing force.

ARGUMENT

Referring first to claim 4, which is the basic one of the three claims here involved, it will be found that the only feature recited which is not clearly shown by Ferris is defined in the expression "diverting a portion of the drawing force, etc." In considering this expression, it is first necessary to determine what is meant by the term "drawing force." In making this interpretation it should be borne in mind that language used in the claims of an application should be given the broadest interpretation which it will reasonably support. Thus, in its decision *In re Carr*, 54 App. D. C. 283, 297 Fed. Rep. 542, this Court said:

> After a patent has issued, and it no longer is possible for the patentee to control the phraseology of his claims,

> the courts will so interpret them, if possible, as to protect him; but there is no reason, as we many times have observed, why an applicant in the Patent Office should not draw his claims to cover his actual invention only. For this reason we have uniformly ruled that claims will be given the broadest interpretation of which they reasonably are susceptible. This rule is a reasonable one, and tends not only to protect the real invention, but to prevent needless litigation after the patent has issued.

The term "drawing force" as used by the appellants does not, as might be supposed, mean the force which is applied to the tool which actually does the drawing, but on the contrary, refers to the force exerted on the piston which actuates the drawing tool. This is not the force which actually does the drawing since a portion of it is diverted to the clamping mechanism and never reaches the drawing tool. Accordingly, the expression in question must be construed as including any force, a portion of which is eventually applied to the drawing tool. The claims are in no way limited to an arrangement in which force is diverted from a piston or equivalent member and, in fact, no such member is recited in any of the claims. Appellants have seen fit to draw their claims broadly to any arrangement in which a portion of a force directed toward the drawing member is diverted to the clamping mechanism and they are not in a position to complain when this broad language is found applicable to a structure specifically different from their own.

In the Ferris structure, liquid from a pump which is operated at constant speed is divided into two parts, one of them passing to the ram of the drawing mechanism and the other to the hydraulic devices which apply the clamping pressure. In this arrangement it will be seen that there is a continuous column of liquid under pressure extending from the ram to the pump. If this column were broken, or if the pump were removed, the pressure on the drawing plunger would obviously be completely released. Moreover, the pump is the prime mover which actually generates and applies the drawing pressure to the plunger. Under these circumstances it seems entirely proper to consider the pressure existing in the outlet line of the pump as a part of the drawing force. No reason appears why the drawing force should be arbitrarily considered as extending to the piston but not to the liquid which exerts the operating pressure on the piston.

The clamping force in Ferris, as already noted, is applied by liquid which is diverted from the supply line extending from the pump to the drawing ram. The operation of Ferris clamping means inherently requires a continuous flow of liquid from the pump so long as the clamps are operative. This is due to the fact that Ferris intends to apply different pressures to different clamping means and that this differential is maintained by means of relief valves which are set to permit the escape of liquid when the pressures reach certain desired points. In order to maintain the operation of such a system it is evident that liquid must escape constantly from those valves which are set at the lower pressures. The liquid which thus flows through the clamping mechanism is diverted from the supply line of the pump and, since the pump operates at constant speed (App. p. 87, line 80), this diversion will necessarily lessen the amount of liquid flowing to the drawing plunger and will consequently lessen the drawing force. It is submitted that such an arrangement clearly involves a diversion of a portion of the drawing force to actuate the clamping mechanism. It is immaterial, so far as the claims are concerned, whether the clamping pressure is generated directly by fluid diverted from the supply line of the main ram or whether all the fluid is allowed to pass to the main ram and the clamping pressure is then built up by elements acting in opposition to the ram. The action of the press would seem to be exactly the same in either case.

While the Ferris structure as a whole may be somewhat different from that of Ernst and may be in some respects more complicated, this difference is not due broadly to a diversion of a portion of the drawing force, since this element is present in the Ferris structure as well as in the appellants'. If the appellants desired to rely on the alleged simplicity of their device, they should have recited in their claims the features from which this simplicity arises. Merely because they may have created a separate device, they are not entitled to the allowance of claims which are broad enough to read on that which is shown by Ferris, or which fail to point out the essential points of difference between the two structures.

It is also to be noted that so far as the actual drawing operation is concerned, it is wholly immaterial what source is used to supply pressure to the clamping mechanism, so long as pressure of a certain degree is applied. It will hold the blank in exactly the same way regardless of what means are employed for generating the pressure. The claims here involved are concerned primarily with a method of drawing metal and, since the structure claimed would produce no result materially different from that of the Ferris structure, it is not thought that the claims would define anything patentable even though they could be so construed as not to be literally readable on Ferris.

The feature just discussed is the only one relied on as distinguishing claim 4 from Ferris. Claim 5 includes the additional limitation of releasing the excess pressure in the clamping mechanism at a predetermined maximum. This feature is fully disclosed by Ferris, for example, in lines 5 et seq., page 4. Accordingly, claim 5 is anticipated by Ferris in exactly the same manner as claim 4. Claim 7 contains the additional statement that pressure is maintained upon the clamping mechanism during the withdrawal of the drawing plunger. This feature is not specifically mentioned by Ferris but it is evident that it involves no invention. If it were found desirable to maintain the blank in clamped relation during the withdrawal of the plunger, the manner of doing this in the Ferris structure would be obvious. It would simply be necessary to maintain the supply of pressure fluid to the clamping sylphons until it was desired to release the clamps. Claim 7 also states that the pressure applied to the clamps during retraction of the plunger is generated by diverting a portion of the retracting force. The retraction of the ram in the Ferris structure is effected by means of pressure from the pump and the pump also provides the pressure for actuating the clamping mechanism. Accordingly, the clamp pressure may properly be considered as generated by a diversion from the retracting force in the manner already fully discussed.

Appellants have offered testimony as to an alleged commercial success of their press. So far as appears from the record, however, the commercial success of the Ferris device may be equally great. Moreover, there is nothing whatever to show that appellants' commercial success is due to the particular features recited in the claims here involved. Under these circumstances and in view of the fact that the operativeness of the appellants' device has not been questioned, it is not thought that this alleged commercial success has any material bearing on the question of patentability.

The appellants in their brief have cited authorities relative to the citation of patents for machines as references against method claims. These authorities generally indicate that the mere existence of a structure which might be used to perform a method does not constitute an anticipation of the method. However, this is not the situation in the present case. The Ferris structure not only might be used to perform the method claimed, but when it is used in the intended manner necessarily does perform this method. Obviously, therefore, the patent constitutes a proper disclosure of the method and it is immaterial that the patentee saw fit to direct his claims to the apparatus rather than to the method. The existence of a full disclosure of the method in the prior art negatives the patentability of the method.

CONCLUSION

It is submitted that the methods set forth in the claims here presented cover merely the normal method of operating the Ferris device, and that the holding of the lower court that these claims cover nothing patentable was, therefore, proper.

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